DOCUMENT RESUME

ED 221 535 SP 021 101

AUTHOR Shavelson, Richard J.
TITLE Review of Research on Teachers' Pedagogical Judgments, Plans and Decisions.
INSTITUTION California Univ., Los Angeles.; Rand Corp., Santa Monica, Calif.
SPONS AGENCY National Inst. of Education (ED), Washington, DC. Teaching and Learning Program.
PUB DATE Feb 82
CONTRACT NIE-400-81-0004
NOTE 90p.; Paper presented at the National Invitational Conference, "Research on Teaching: Implications for Practice" (Warrenton, VA, February 25-27, 1982). For related documents, see SP 021 097-107 and ED 218 257.

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Annotated Bibliographies; *Cognitive Processes; *Decision Making; Educational Research; Elementary Secondary Education; *Instructional Development; *Problem Solving; Student Teacher Relationship; *Teacher Response; *Teachers

ABSTRACT

In this paper, research on teachers' judgments, instructional planning, and decision making during classroom interaction is reviewed. Research studies chosen for this paper were selected on the basis of two fundamental assumptions: (1) Teachers behave reasonably in making judgments and decisions; and (2) Their behaviors are guided by their thoughts, judgments, and decisions. Research methods used in the studies include policy capturing, lens modeling, process tracing, stimulated recall, case study, and ethnography. It is noted that it was difficult to evaluate some of the individual studies examined, so that replicability was used as a criterion for inclusion. If studies which, individually, could not be evaluated adequately on methodological grounds produced consistent results, they were included. Sections evaluating research studies on teachers' judgments, planning, and interactive decision making are followed by a section containing annotations of the 25 research studies reviewed. (JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED221535

UNITED STATES DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
WASHINGTON, D.C. 20208

RESEARCH ON TEACHING: IMPLICATIONS FOR PRACTICE

A NATIONAL INVITATIONAL CONFERENCE
FEBRUARY 25-27, 1982
AIRLEE HOUSE
WARRENTON, VIRGINIA

CONFERENCE SPONSOR — THE NATIONAL INSTITUTE OF EDUCATION
TEACHING AND INSTRUCTION
1200 19TH ST., N.W.
WASHINGTON, D. C. 20208-1101

REVIEW OF RESEARCH ON TEACHERS' PEDAGOGICAL JUDGMENTS, PLANS AND DECISIONS

Richard J. Shavelson
The Rand Corporation
and
The University of California, Los Angeles

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

*This review was compiled for the NIE's "Teaching Synthesis Project" (NIE 400-81-0004). The opinions expressed herein do not necessarily reflect the position or policy and imply no official endorsement of the NIE, The Rand Corporation or UCLA. Portions of this review will appear in the International Encyclopedia of Education. Much of the review is based on Shavelson, R. J. and Stern, P., Research on teachers' pedagogical thoughts, judgments, decisions, and behavior. Review of Educational Research, 1981, 51, 455-498.

SP 021 101

CONTENTS

I. INTRODUCTION 1

II. TEACHERS' JUDGMENTS 7

III. TEACHERS' PLANNING 21

IV. TEACHERS' INTERACTIVE DECISIONMAKING 29

V. ANNOTATED REFERENCES 38

REFERENCES 78

I. INTRODUCTION

In this paper, research on teacher's judgments, instructional planning, and decisionmaking during classroom interaction is reviewed. The need for research on teaching to examine teachers' judgments, plans and decisions and their link to behavior, and not just behavior alone, has been justified on several grounds. One justification is that a solely behavioral model is conceptually incomplete. It cannot account for predictable variations in teachers' behavior arising from differences in their goals, judgments, and decisions. A second justification is that research linking teachers' intentions to their behavior will provide a sound basis for educating teachers and implementing educational innovations. That is, this research models segments of the broader experience of teachers and so clarifies coherent prototypes for important teaching activities.

This research rests on two fundamental assumptions. The first assumption is that teachers are rational professionals who, like other professionals such as physicians, make judgments and carry out decisions in an uncertain, complex environment (e.g., Clark, 1978-79; National Institute of Education, 1975; Shavelson, 1973, 1976; Shavelson and Stern, 1981; Shulman & Elstein, 1975). This assumption of rationality actually refers to teachers' intentions for their judgments and decisions rather than to their behavior for at least two reasons.

The first, most obvious reason is that some teaching situations call for immediate, rather than reflective, responses that probably preclude rational processing of information in making an informed judgment or decision.

The second reason is that a person's capacity for formulating and solving complex problems such as those presented in teaching is very small compared to the enormity of some "ideal" model of rationality. A person constructs a simplified model of the real situation in order to handle its complexity. Teachers, then, behave rationally with respect to the simplified model of reality that they have constructed. The conception of teachers--rational within the constraints of their information processing capabilities--leads to a modification of the first assumption: Teachers behave reasonably in making judgments and decisions.

The second assumption is that teachers' behaviors are guided by their thoughts, judgments and decisions. If this is not true, "then teachers are automata of some kind" (Fenstermacher, 1980, p. 36).

Research on teachers' judgments and decisions has a characteristic set of methods somewhat different from previous correlational and experimental research. Research on teachers' mental processes uses more or less direct probes of teachers' thoughts and judgments. They include policy capturing, lens modeling, process tracing, stimulated recall, case study and ethnography (for discussions of one or more of these methods, see Einhorn, Kleinmuntz & Kleinmuntz, 1979; Ericsson & Simon, 1980; Erickson, 1979 a, b; Shulman & Elstein, 1975).

Policy Capturing and Lens Modeling. In a policy capturing study, techers would be given (say) descrtiptions of 32 hypothetical students, systematically varying five variables such as student achievement, gender, class participation, ability to work independently, and classroom behavior. Each teacher would judge each student's chance of (say) earning a B average or better at the end of the school year.

Teachers' judgments would then be predicted from the five variables describing the student. The prediction equation would be interpreted as a model of the teacher's policy for judging students' probable success. Policy capturing models turn out to be quite simple in form--typically a simple additive model seldom with more than three variables often predicts judgments quite well--even though the model may represent fairly complex judgmental strategies (Einhorn et al., 1979).

There are, however, several problems in the application of this approach: (1) Typically policy capturing studies are carried out in a laboratory with hypothetical judgmental tasks, although this need not be the case. Hence, a question of generalizability arises. (2) Prediction equations typically combine data from all of the teachers in a study. However, this assumes that each teacher has exactly the same policy. Cadwell (1980) has shown both theoretically and empirically that this usually is not the case; subsets of teachers may share the same policy or each teacher may have a unique policy. (3) Great care must be taken in interpreting the results of the policy capturing study. The prediction equation provides an "as-if" model; it does not mean that teachers actually take a weighted sum of the variables.

In a lens modeling study, three pieces of information are required: (a) a criterion measure of the event being judged (say, students' preferences for reading materials), (b) a list of cues predictive of the criterion measure (say, presence or absence of fantasy, animals, danger, and humor), and (c) teachers' judgments of students' preferences (i.e., predictions of each student's reading preference). The correlation between a teacher's predictions of students' reading preferences and students' actual preferences provides a measure of overall judgmental

accuracy. And a regression of a teacher's judgments on the cues provides a model of the teachers' policies for reaching their judgments. The problems in this approach are similar to those of policy capturing.

Process Tracing and Stimulated Recall. In a process tracing study, subjects are asked to "think aloud" while performing a task, solving a problem, or reaching a decision. For example, Peterson, Marx and Clark (1978) asked teachers to think aloud while they planned a social studies lesson. The verbal protocol becomes the data to be analyzed. The analysis may be content analysis (e.g., the number of references to behavioral objectives is counted) or a flow chart modeling the teacher's thought processes (e.g., Fig 2).

With stimulated recall (typically used when process tracing interferes with task performances) a teacher's lesson is either audio- or videotaped and, after the lesson (or after school, depending on scheduling), played back to the teacher who attempts to recall the covert mental activities that accompanied the overt behavior.

Both techniques use verbal reports as data bearing on the cognitive processes of teachers. They assume that teachers are able and willing to articulate their thought processes. This assumption of introspection has a long and controversial history (cf. Nisbett and Wilson, 1977; Ericsson and Simon, 1980). Ericsson and Simon (1980) provide an analysis of when introspective data are accurate and when they are not. They (Ericsson & Simon, 1980, p. 247) concluded that:

> It is time to abandon the careless charge of "introspection" as a means for disparaging such data. They describe human behavior that is as readily interpreted as any other human behavior. To omit them when we are carrying the "chain and transit of objective measurement" is only to mark as terra incognita large areas on the map of human cognition that we know perfectly well how to survey.

Case Study and Ethnography. A case study is a narrative account of an object of social inquiry such as a classroom, a school system or any other bounded system (cf. Stake, 1978). Ethnography is a narrative study (usually more descriptive than theoretical) of a bounded system in its cultural context. The more psychologically and cognitively oriented ethnographers assume that "individuals have meaning structures that determine much of their behavior...[and] that they seek to discover what these meaning structures are, how they develop, and how they influence behavior, in as comprehensive and objective a fashion as possible" (Wilson, 1977, p. 254). Qualitative research, then, "is predicated upon the assumption that an 'inner understanding' enables the comprehension of human behavior in greater depth than is possible from the study of surface behavior, from paper and pencil tests and from standardized interviews" (Rist, 1979, p. 20).

The assumptions of qualitative research are quite consistent with a major premise of research on teachers' decisionmaking, viz., in order to understanding teaching, teachers' goals, judgments and decisions must be understood, especially in relation to teachers' behavior and the classroom context. The potential contribution of qualitative research to research on teaching is that fieldwork methods (e.g., participant observation, focused interviewing) and analytic techniques (e.g., development of conceptual and categorical systems from the data themselves) have been developed by qualitative researchers and have their canons of methodological rigor just as quantitative methods do (e.g., Erickson, 1979a, b; Filstead, 1970; Wilson, 1977).

The fact that qualitiative methods have their own canons of methodologial rigor is often blurred by the misuse of these methods

(Rist, 1980). Erickson (1979b) pointed out a number of limitations and potential problems with ethnographies, some of which arise when the methodological canons become blurred: (a) Timing--by the time the ethnology is written up, it is too late for use in the short run. (b) Validity--ethnographers may not have been intensive enough, or they may have been inept; the informants may not have been articulate, or they may have concealed information. (c) Superficiality--description may have stopped at surface appearances. (d) Evidentiary adequacy--the level of inference about overall trends may not be supported by the data.

Methodological Adequacy of the Studies Reviewed. The studies examined in this review have used a wide variety of research methods. The methodological adequacy of the findings of some types of studies (e.g., experiments with standard psychometric instruments) are easier to evaluate than other types of studies (e.g., short reports of ethnographies, stimulated recall data). Researchers studying teachers' thoughts, judgments, and decisions often do not: (a) provide adequate descriptions of their methods, (b) incorporate methodological checks in their studies, or (c) systematically study methods used in this field of research. Given these limitations, it was virtually impossible to critically evaluate some of the individual studies examined in the review. In this case, replicability was used as a criterion for including the study. If studies which, individually, could not be evaluated adequately on methodological grounds produced consistent results, they were included.

II. TEACHERS' JUDGMENTS

Judgment refers to the process of evaluating or categorizing a person or an object. Often the process of judgment is called classification, selection or estimation. This process is not simply the application of a rule; judgment goes beyond the available information, adding information as the process progresses (cf. Shulman and Elstein 1975).

Teachers classify students. Teachers, for example, classify students according to ability. This classification can be seen in the membership of different reading groups, teams, and so on. Teachers select students for referrals to special education, to tasks such as taking attendance, reading an essay, and the like. And teachers estimate students' ability, class participation, independence, self-concept and so on.

Judgment, then, permeates teaching. It is an important process that, until recently, has been given little systematic attention by researchers on teaching, and even less attention by teacher trainers.

Conceptualizations of Teachers' Judgments

Perhaps one of the first attempts to conceptualize the judgmental processes used by teachers was reported by Varner in 1923. Actually Varner was studying the accuracy of teachers' ratings of students' intelligence because, in the absence of measurements of traits other than intelligence, teachers' ratings of these traits would have to be

used. In the case of intelligence, a criterion--the IQ test--existed. Teachers' rating of students' intelligence could be compared with this criterion. From this comparison, Varner reasoned, a generalization could be drawn about the accuracy of teachers' rating of other traits.

Varner (1922, 1923) assumed that teachers' ratings (i.e., estimates of students' intelligence, hence judgments) were inaccurate. He identified five factors that contributed to this inaccuracy and, by doing so, developed a conceptualization of the judgmental process not unlike some aspects of present-day conceptualizations.

One factor influencing teaches' judgments was that teachers tended to be influenced by traits other than intelligence in rating intelligence (e.g., industry, personality, appearance). This factor, then, is akin to a halo effect in the judgmental process (see Heuristics below; see also Teacher Expectancy).

A second factor was that some teachers failed to take students' ages into account when rating their intelligence. Varner presented evidence that, as expected, teacher ratings correlated higher with an intelligence quotient than with mental-age scores. In other words, teachers failed to consider available information which could increase the accuracy of their ratings.

Third, the accuracy of teachers' ratings was lower for younger children than for older children. For example, Varner (1922) found that teachers' classifications of children into the highest and lowest 20th percentiles more closely approximated a classification based on intelligence test scores for eighth grade students (42% correctly classified in the highest group; 63% correctly classified in the lowest group) than for second grade students (22% and 53%, respectively). This

finding is consistent with current psychometric data; measurements on very young children are less reliable than measurements on older children due, in part, to differences in rates of intellectual, emotional, and experiential growth.

A fourth factor was the inability of teachers to compare their pupils with pupils in general of corresponding grade levels. Put in more modern terms, teachers' relative judgments (ordering of students within their classes) were more accurate than their absolute judgments of their students' IQ scores. This finding is consistent with psychometric theory and empirical findings that errors of measurement associated with absolute judgments are greater than or equal to errors associated with relative judgments (e.g., Shavelson and Webb 1981).

The fifth factor was the teachers' tendency to rate students too high. Teachers tended not to want to rate children too low. This is consistent with recent findings of leniency in, for example, grading.

Varner (1923) conducted a series of studies which provided a test of this conceptualization of teacher judgment. He constructed detailed instructions and a rating form which addressed each factor. He demonstrated, under a variety of conditions, that teachers' ratings using his rating instrument were more accurate than ratings made without it. For example, in one study, correlations of teachers' ratings of IQ without the instrument with IQ test scores ranged from 0.31 to 0.71 with a median of 0.58 while these ratings with the instrument ranged from 0.63 to 0.70 with a median of 0.64. Correlations with mental-age scores of ratings of MA without the instrument ranged from 0.23 to .66 (median = 0.42) while with the instrument, the correlations ranged from 0.39 to 0.81 (median = 0.64).

About 50 years later, Shavelson (1973, 1976; see also Shulman and Elstein 1975) developped a model of teachers' judgments and pedagogical decisions as a heuristic for organizing and conducting research on teaching. The model suggested a set of questions and conjectures about what information teachers use in making pedagogical judgments, how this information is integrated to reach judgments, and how institutional constraints and individual differences between teachers affect these judgments (see Fig. 1).

The model assumes that teaching is a process by which teachers make reasonable judgments and decisions with the intent of optimizing student outcomes (Shavelson 1976). While teachers' judgments and decisionmaking does not always match this description, it seems to apply to many goal-oriented teaching situations. For example, in recalling their thoughts while viewing a videotape of their teaching:

> Teachers were most affected by their concern for the pupil and based many of their decisions on what they surmized was happening with the individual student.... Content accounted for the bulk of the remaining concerns voiced. Teachers apparently focused much of their attention on what was occurring during the lesson, i.e., what the students were hearing, saying, doing, and feeling (McNair 1978-79, p. 32).

Teachers are seen as active agents with many instructional techniques at their disposal to help students reach some goal. In order to choose from this repertoire, they must integrate a large amount of information about students from a variety of sources. And this information must somehow be combined with their own beliefs and goals, the nature of the instructional task, the constraints of the situation, and so on, in order to reach a judgment (for details, see Shavelson and Stern 1981).

More specifically, the model (Fig. 1) identified some important factors which may affect teachers' judgments. Teachers have available a large amount of information about their students. Teachers usually seek information about their students' general ability or achievement, class participation, self-concept, social competence, independence, classroom behavior and work habits (Shavelson and Stern, 1981). This information comes from many sources such as their own, informal observations, anecdotal reports of other teachers, standardized test scores and school records (see Shavelson and Stern, 1981, for references). In order to handle the information overload, teachers integrate this information into judgments about the student's cognitive, affective and behavioral states (see Shavelson and Stein, 1981, for references). These judgments, if relevant, are used in making pedagogical decisions (e.g., Shavelson 1976).

Attributions and heuristics (Fig. 1) posits that information is selected and integrated by teachers to reach a judgment, in part, on the basis of a few heuristics and their attributions for the causes of events. Teachers' attributions for the causes of achievement may serve as the basis for teachers' judgments about students, such as student ability, effort, and classroom behavior (cf. Borko and Shavelson 1978). Thus, the literature on attribution theory in general and achievement attribution in particular is pertinent; it has been reviewed by Kelley and Michela (1980) and Weiner (1977; see also Borko and Shavelson 1978; Nisbett and Ross 1980) and so will not be reviewed here.

Due to the inability of people to handle, simultaneously, large amounts of information, they use heuristics for selecting information (salience and vividness heuristic), judging the frequency or probability

of an event (availability), classifying persons and objects (representativeness), and revising their initial judgments (adjustment and anchoring). While these heuristics lead to accurate judgments in many situations, they may also lead to predictable errors (Tversky and Kahneman 1974; Nisbett and Ross 1980). The representativeness heuristic, for example, states that people decide whether or not some person or object belongs to a particular category by judging the similarity between the attributes of the person or object and the attributes of the category (Tversky and Kahneman 1974). For example, when a description of a student matches the stereotype of a slow learner, even if the description is unreliable, incomplete, or outdated, people often predict with high certainty that the student is a slow learner. And Dusek (1975) and Smith and Lugenbuhl (1976) have shown that, in laboratory studies, teacher-student interaction is influenced by unreliable information about the student.

The anchoring heuristic states that "people make estimates about events and other people by starting from an initial value that is adjusted to yield a final answer. The inital value, or starting point, may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient. That is, different starting points yield different estimates, which are biased toward the inital values" (Tversky and Kahneman 1974, p. 1128). For example, subjects were asked to estimate percentages of African countries in the United Nations. They were given an initial percentage determined at random and asked to estimate the actual percentage. Groups of subjects beginning at either 10 percent or 65 percent estimated actual percentages of 25 and 45,

respectively. Shavelson et al. (1977) suggested that this heuristic might be one mechanism underlying the teacher expectancy phenomenon in that a teacher's initial expectation may serve as an anchor for his subsequent estimate of the student's ability. In a number of studies reviewed by Dusek (1975), for example, initial but not necessarily valid information about students influenced ("anchored") the way in which tutors taught students. Brophy and Good (1970) found that teachers' estimates of student ability influenced teacher-student interaction.

Shavelson et al. (1977), in a laboratory simulation, examined subjects' estimates of a student's ability based on either reliable or unreliable information, and their willingness to revise these estimates on the basis of subsequent information, which was either reliable or unreliable. They reported that:

> ...the subjects did consider the reliability of the information, adjusting their estimates in the direction predicted by...[a normative] Bayesian model. Furthermore, the anchoring heuristic and research on teacher expectancy suggest that initial estimates are difficult to overcome, even in the face of conflicting information. Nevertheless, the data show that the subjects did revise initial probability estimates, as expected by Bayes' Theorem (p. 95).

These findings are in contrast to much of the judgment literature on the use of heuristics (e.g., Einhorn and Hogarth 1978, Slovic et al. 1976). There are a number of possible explanations. One is that the research in most of the literature has used undergraduate students making judgments in areas outside their expertise and so experts may not fall prey to these errors (Winkler and Murphy 1973; but see Slovic et al. 1976). Hence, subjects in the Shavelson et al. study (teachers and students in a graduate school of education), being professionals, may

have not fallen prey to errors based on the anchoring heuristic. A second possible explanation is that the laboratory simulation was so highly structured that the subjects could only act rationally. Further research is needed to decide which of these or some other explanation is most plausible.

Attributions refer to the processes by which people integrate information to arrive at causal explanations for events (Borko and Shavelson 1978). To make attributions, the perceiver (e.g., teacher) is assumed to know the generality of an actor's (e.g., student's) behavior across contexts (consistency information), across entities (distinctiveness information) and the generality of the reaction across other actors (consensus information). Various patterns of this information give rise to different attributions. Attributions to the actor (student) arise when there is high consistency (Sally always passes this particular math test), low distinctiveness (Sally passes most other math tests) and low consensus (hardly any other student passes this particular math test). Under these conditions teachers would perceive Sally as a good math student. Attributions to the test (stimulus attribution) occur when Sally always passes this test (low distinctiveness), and everyone else passes the test (high consensus). When a perceiver has limited information, the individual will try to find the pattern most consisternt with the information available.

Finally, conflict-stress refers to psycho-emotional processes. These processes may affect the choice of information teachers use to construct their psychological reality (cf. Janis and Mann 1977), even though past research in this area has not focused on teachers.

By generalization, heuristics, attributions and conflict-stress might be expected to influence teachers' judgments about students, instructional activities, and institutional constraints. Depending on the focus of the research, these judgments may take the form of expectations, hypotheses, or inferences.

Research Modeling Teachers' Judgments

Much of the research on teachers' judgments and decisionmaking has used a policy capturing approach. With this approach, for example, a teacher makes judgments about a number of students based on their observations (etc.) of the students in their classroom or based on information provided by the researcher. Then the teacher's judgments are predicted on the basis of information available to the teacher (e.g., achievement, work habits, classroom participation, classroom behavior). The result is a statistical model which weights each piece of information in order to maximize prediction of the teacher's actual judgments.

Research in the literature on human judgment has found that people's policies can be represented by an additive model with about three pieces of information in the model. Research on teachers' policies for judging ability, motivation and the probability that a student will be a behavior problem supports these findings in the more general literature. Laboratory simulations (see Shavelson and Stern in press, for references) have found that, in judging student ability, teachers primarily use information about student achievement but also may use information about problematic behavior. In judging motivation (effort), teachers rely heavily on information about achievement,

problematic behavior and work habits. And estimates of behavior problems rely on information about classroom behavior and, to a lesser extent, achievement.

Research on human judgments has found that people are generally unaware of the nature of their judgment policies. Hence, they report using more information in more complex ways than is suggested by the statistical model of their policies (e.g., Shulman and Elstein 1975; Slovic et al. 1975). Studies of teachers' policies parallel these findings. For example, Clark et al. (1979) reported that teachers were unaware of their judgment policies.

Accuracy of teachers' judgments of students' intelligence. Research on the accuracy of teachers' judgments of their students' intelligence typically has correlated intelligence-test scores with teachers' ratings or rankings of their students. This research shows that teachers are, in general, reasonably accurate in spite of what might be asserted by critics. Based on eight studies reported before 1930, the median correlation was 0.54 with a range from 0.31 to 0.70. Based on six studies reported since 1930, the median correlation was 0.54 with a range from 0.42 to 0.81.

How high should this correlation be? Critics might consider a correlation of 0.54 between teachers' judgments and intelligence-test scores too low. In contrast, some researchers consider this degree of accuracy credable. In making your own decision, consider the following. First, most "strong" validity coefficients (correlations between predictors such as teachers' judgments and criterion scores such as intelligence-test scores) are, in magnitude, 0.50. It is unusual for validity coefficients to rise above 0.60. Second, teachers' implicit

definitions of intelligence do not correspond to the definiton that guides intelligence-test construction, something Varner recognized in 1923. Hence, teachers' ratings are not measuring exactly the same trait as are intelligence tests. This fact will tend to reduce the correlations.

Coverage of this topic would be incomplete without noting the large variability between the accuracy of different teachers' judgments of their students' intelligence. Accuracy, as measured by correlations, generally range from lows in the 0.20's to highs in the 0.80's. Few studies have examined what accounts for this variability; Varner's (1923) is a notable exception.

Accuracy of teachers' judgments of students' achievement. Research on the accuracy of teachers' judgments of their students' achievement typically has correlated teachers' ratings or grades assigned to students with achievement-test scores. This research shows that teachers are reasonably accurate in making this judgment (see Shavelson and Stern, 1981, for references). The median correlation based on over 15 studies was 0.71 with a range from 0.33 to 0.96.

Judgments and diagnoses regarding reading. Byers and Evans (1980) studied the accuracy of teachers' judgments of students' reading interests. Teachers judged their students' reading preferences; students' actual reading choices served as the criterion measure. They found that students' reading interests fluctuated widely over grade level and gender, and that teachers, on average, inaccurately predicted students' reading preferences (over-all range of accuracy was -.23 to .69 with a mean of .23), because they lacked knowledge about students' interests.

Teachers' and expert clinicians' diagnoses of children with reading problems have been studied extensively by Vinsonhaler and his colleagues (e.g., Vinsonhaler 1979; see also Gill 1980; Weinshank 1980). They have conducted three types of studies: (1) laboratory and classroom studies of reading specialists, special education personnel and classroom teachers diagnosing children's reading problems; (2) computer simulation studies; and (3) training studies.

Four laboratory and classroom studies have examined the degree to which reading clinicians and classroom teachers agree on the diagnosis of reading problems (Gil 1980; Vinsonhaler 1979; Weinshank 1980). The Agreement Corollary of their Inquiry Theory states that (a) individuals' diagnoses are more closely related to the "average diagnosis" based on a group of clinicians ("group agreement") than are diagnoses among individuals, and (b) agreement between diagnoses made by one individual on equivalent cases ("intra-clinician agreement") should be greater than agreement between clinicians ("inter-clinician agreement").

The results of the studies indicated that there was a reasonable level of group agreement (e.g., agreement measure of .55 in Vinsonhaler 1979; and .45 in Gil 1980) on diagnosis. However, the intra-clinician agreement coefficients (e.g., .17 in Vinsonhaler 1979; and .14 in Weinshank 1980) and the inter-clinician agreement coefficients (e.g., -.07 in Vinsonhaler 1979; -.04 in Gil 1980; and .11 in Weinshank 1980) were very low. Reading clinicians, special educators, and classroom teachers did not agree with themselves and with each other on diagnosis. Neither did they agree on remediation (inter-clinician agreement = .10, intra-clinician agreement = -.20; Weinshank 1980). In addition, a correlation of zero was found between diagnosis and remediation at the individual level (Weinshank 1980).

Gil (1980) observed and interviewed teachers about their diagnoses. He found that the 10 teachers: (a) lacked systematic strategies for collecting and using information to reach diagnostic decisions, (b) differed on a number of process variables such as the length of their interaction with a case and the number of cues collected, and (c) used general and incomplete diagnostic strategies both in the laboratory and in the natural classroom setting. Teachers appeared to lack information procesing strategies to make complete, specific diagnoses. In addition, Weinshank (1980) found that individual clinicians interacting with a case tended not to follow their stated plans of action regarding data collection procedures, diagnosis and remediation.

Computer simulation studies examined diagnostic accuracy as a function of (a) having a specific routine for collecting information on a case; and (b) generating a few or many hypotheses, depending on the certainty of the hypotheses. These studies found that simulations that used routine cue collection procedures and generated hypotheses early performed significantly better than those that did not. However, the simulations did not perform as well as the human clinicians who diagnosed the same cases. Finally, training teachers to conduct a systematic diagnosis of a reading problem increased the accuracy of their dignoses. Nevertheless, the accuracy for most trainees was below that considered appropriate.

Concluding comment. Teachers' judgments are a critical component of the teaching process. Their judgments of general ability traits--intelligence and achievement--are reasonably accurate. However, the accuracy of their judgments of students' behavior on particular tasks--or of students' reading problems--is considerably lower than would be

hoped for. While there is some evidence that training can overcome, to some degree, these inaccuracies, additional research on teachers' judgmental processes is needed. Such research would serve as the basis for training teachers to improve their judgments. By doing so, we might just be able to improve the effectiveness of teachers in helping students reach valued educational goals.

III. TEACHERS' PLANNING

Teachers' planning refers to that aspect of teaching where teacher formulate a course of action for carrying out instruction over a school year, a semester, a month, a day, or a lesson. Planning is one important component of teaching that is typically carried out without the presence of students. That is, planning is teaching in an empty classroom.

The importance of planning cannot be overestimated. Decisions mad by teachers while planning instruction have a profound influence on their classroom behavior and on the nature and outcomes of the educatio children receive. Teachers' instructional plans serve as "scripts" for carrying out interactive teaching (Shavelson and Stern, 1981; see also Smith and Sendelbach 1979). Scripts exert such a strong influence on teachers that they tend not to deviate from them once they have begun teaching (Shavelson and Stern, 1981; see also Joyce 1978-79; Peterson and Clark 1978; Zahorik 1970). By knowing a teacher's script for a particular lesson, much of the teacher's behavior in the classroom can be predicted. Stern and Shavelson (1980) found this to be true of reading instruction and Smith and Sendelbach (1979) found this to be true of science instruction using ethnographic studies of single classrooms.

Teachers' planning decisions influence the content, materials, social climate, and activities of instruction. For example, decisions about curriculum adoptions, or at least selections from and

modifications of adopted curriculum, affect the process of teaching (Smith and Sendelbach 1979) as well as what children learn (Walker and Schaffarzick 1974). Also decisions about grouping students for reading have been shown to have such a profound effect that children in the highest reading group may be paced 13 times as fast as children in the lowest reading group with reading test scores reflecting this difference in pacing (Shavelson and Borko 1979).

Teachers' Instructional Plans

Most teachers are trained to plan instruction by: (a) specifying (behavioral) objectives, (b) specifying students' entry behavior (knowledge and skills), (c) selecting and sequencing learning activities so as to move students from entry behavior to objectives, and (d) evaluating the outcomes of instruction in order to improve planning. While this prescriptive model of planning may be one of the most consistently taught features of the curriculum of teacher education programs, the model is consistently not used by teachers in planning instruction. Obviously there is a mismatch between the prescriptive planning model and the demands of classroom instruction. This mismatch arises because teachers must balance multiple educational goals (e.g., content instruction, behavior control, social interaction), must take into account students' goals (peer relations, learning), and must maintain the flow of activity during a lesson or face behavioral management problems (Doyle 1979 1980). Activities, then, and not the prescriptive model are the focus of teacher planning.

As Taylor (1970) pointed out, most planning appears unsystematic and general in nature. Teachers appear uncertain as to what the

planning process requires. To date, research on teacher planning has not led to the formulation of a model of teachers' planning; rather, it has identified components that such a model must incorporate to be descriptive and to be realistically prescriptive.

The instructional activity is the basic instructional unit of planning (Clark and Yinger 1979; Peterson et al. 1978; Smith and Sendelbach 1979; Yinger 1977; Zahorik 1975) and action in the classroom (Shavelson and Stern, 1981). We term the basic, structural unit of planning the "task." A task is comprised of several elements which have individually been identified in the planning literature. One element is content, the subject matter to be taught (e.g., Clark and Yinger 1979). Once a curriculum has been selected, teachers accept the text book as the major, usually only, source of content (e.g., Smith and Sendelbach 1979; Shavelson 1976). A second element of a task is materials, those things that children can observe and/or manipulate (e.g., Morine-Dershimer 1978-79; Peterson et al. 1978, Zahorik 1975). A third element of a task is activity, the things the teacher and students will be doing during the lesson (e.g., Clark and Yinger 1979; Smith and Sendelbach 1979). The concept of activity includes sequencing, pacing and timing the instructional content and materials (cf. Smith and Sendelbach 1979; Taylor 1970). A fourth element is goals, the teacher's general aim for a task, usually learning, effect or both. Goals are not the same as behavioral objectives; they are much more general and vague, but functional (cf. Clark and Yinger 1979). A fifth element is students, especially their abilities, needs and interests (Borko et al. 1979; Morine-Dershimer 1978-79; Shavelson, Atwood and Borko 1977). The last element is social-cultural context of instruction (cf. Florio 1979;

Janesick 1978; Shavelson and Borko 1979). This refers to the class as a whole and its sense of "groupness" (Janesick 1978) or a specially created community (Florio 1979) as well as teachers' groupings of students for instruction (e.g., tutor-tutee, reading groups; cf. Barr 1974, 1975; Borko 1978; Shavelson and Borko 1979).

The conception of teachers' planning presented here is one in which instructional tasks are created by the teacher. In creating tasks, we know that teachers juggle some or all of the elements described above. In addition, we know that any conception of planning must include a time dimension. One aspect of the time dimension is the hierarchical organization of planning; Yinger (1977, p. 172) identified five levels:

1. Long range yearly--basic ideas for social studies, science--some for math and reading--basic structure of what will be done but not specific time.
2. Term--planning on a term basis for social studies, science, and for movies.
3. Monthly--deciding on basic units for social studies, science, and math. I decide on what I need librarian to get or what movies I need.
4. Weekly--use teacher's plan book--specific units and time element added--more detailed.
5. Daily-- put schedule on board, getting actual materials out.

A second aspect of the time dimension is that planning decisions made early in the academic year exert a profound influence on teachers' planning for the remainder of the year (e.g., Clark 1978-79; Joyce 1978-79). According to Joyce (1978-79 p. 75):

> Most of the important preactive decisions by teachers are long-term in their influence as opposed to the in influence of lesson by lesson planning. Relatively early in the year, most teachers set up a series of conditions which were to be powerfully influential on the possibilities of decision making thereafter. Lesson planning, to the extent that it goes on consciously, involves the selection and handling of materials and activities within the framework that has been set up by the long-term decisions.

Studies of Teacher Planning

Researchers studying teacher planning have used a variety of methods including questionnaires/interviews (e.g., Morine-Dershimer 1978-79a-c; Zahorik 1975), ethnography (e.g., Yinger 1977), simulations (e.g., Borko 1978; Morine 1976; Russo 1978; Shavelson et al., 1977; Yinger 1977) and "think aloud" protocols (e.g., Peterson et al. 1978). Not surprisingly, different methods reveal different aspects of the planning process. Nevertheless, for the most part, the findings, as summarized above, have been consistent or complementary. Namely, teachers focus on tasks and embedded in these tasks are teachers' concerns about content, activities, students, goals, and the like.

The results of research on teacher planning are summarized in Table 1. Most of the research has found that teachers are concerned with subject matter in planning instruction. Their concern, however, is less with the structure of the subject matter (cf. Schwab 1962; Shavelson 1972, 1974, 1981) and more with the selection of content for the purpose of building tasks (cf. Clark 1978-79; Shavelson and Stern, 1981).

Research also has found that teachers consider information about students, especially student ability, when planning instruction (e.g., Cooper et al., 1979; Borko 1978; Morine-Dershimer 1978-79b; Russo 1978; Shavelson et al., 1977). Both Morine-Dershimer (1978-79b) and Mintz (1979) pointed out that teachers' concerns about students in their planning were greatest early in the year when teachers were "getting to know" their students. Once teachers had reached a judgment about their students, less attention (i.e., conscious concern) was given to students in verbal reports. In contrast, Peterson et al. (1978) reported that verbal protocols showed little mention of students during planning. However, these contradictory findings may be an artifact of the methods used. First, in the Peterson et al. (1978) study, students (unknown previously by the teacher) were randomly assigned to teachers. These teachers, then, did not have information about their students. Second, Morine (1978-79b) has pointed out that "while the...teachers rarely mentioned pupil ability, specific objective [sic], teaching strategy, or seating arrangement in response to the general question [to state their lesson plans], their ready responses to the probes indicated that the mental plans or images of the lesson...did include such aspects of instruction" (p. 85, italics ours).

A central focus of teachers is the activity developed in the lesson plan (see Table 1). Activity refers to the allocation of time, the sequencing and the timing (or pacing or flow) of content and materials during the lesson. While most research has found the activity to be of central importance in plans, little is known about how activities are constructed or what routines or "scripts" teachers bring to the planning process which are filled out monthly, weekly and daily (cf. Yinger 1977)

to provide the routine for interactive teaching. Yinger's (1977) study provides some insight into activity planning. The teacher he studied approached the activity as a three-stage problemsolving task including: (1) problem finding where content, goals, knowledge, and experience combined to yield an initial conception of the activity worthy of future consideration; (2) problem formulation and solution involving progressive elaboration of the activity; and (3) activity implementation emphasizing "evaluation and routinization to the teacher's repertoire of knowledge and experience, which in turn play a major role in future planning deliberations" (Clark and Yinger 1979, p. 238). Research, having established the task as a central focus in planning, needs to move on to describing the variety of routines or scripts teachers have for planning activities and under what conditions they are used.

Most naturalistic research reports that objectives do not play a major role in the planning process while laboratory simulation studies report that teachers do take objectives/goals into consideration. This conflicting finding might be resolved on methodological grounds. Apparently teachers' verbal reports and lesson plans do not emphasize objectives. However, in laboratory simulations asking teachers to make decisions about goals or objectives, teachers do so and report that doing so is consistent with their classroom planning (e.g., Borko 1978; Russo 1978). As Morine-Dershimer (1978-79b) pointed out, while objectives are not part of their verbal reports about lesson plans, they are part of the teachers' mental image or plan. Probing, done either directly or indirectly as in simulations or interviews, is apparently needed to find this out.

Finally, several studies have shown that teachers, at the beginning of the academic year, set forth plans and make decisions that guide subsequent planning over the remainder of the year. This means that, unless researchers examine planning at the beginning of the year, they are liable to miss some aspects of planning. They are also liable to conclude that teachers do not, for example, consider student characteristics or objectives when, during most of the year, such information is part of the teacher's planning script or routine. Moreover, these long-term plans have a profound influence on classroom teaching. "In effect, the selection of materials and the subsequent activity flow establishes the 'problem frame'--the boundaries within which decisionmaking will be carried on" (Joyce 1978-79, p. 75; italics in original).

There are a few findings, not reported in Table I, that deserve attention. Several studies have found that management of students is a primary concern in planning (Smith and Sendelbach 1979), especially in grouping students (Mintz 1979; Stern and Shavelson 1980). And Zahorik (1970) observed that teachers who planned thoroughly were less sensitive to their students (i.e., encouraged student ideas and discussion less). Peterson et al. (1978) found that teachers who were prolific planners had students with lower attitude scores than students whose teachers did not plan extensively. These last two studies suggest planning may be counter-productive if teachers become single-minded and do not adapt their lesson to student needs.

IV. Teachers' Interactive Decisionmaking

Teachers' interactive decisionmaking refers to decisions teachers make while interacting (e.g., lecturing, discussing, tutoring) with their students. These decisions have been characterized as "inflight" or "real-time" decisions since teachers typically do not have the luxury of time to reflect upon these decisions or to seek additional information before deciding upon a course of action.

Teachers' interactive decisions are greatly influenced by their plans (see "Teachers' Planning"). Instructional tasks--including the goals, content, materials, activities and timing of instruction--constitute a large part of teachers' planning activity. These instructional tasks--perhaps in the form of mental "scripts" (cf. Abelson 1976, Schank and Abelson 1977) or "images" (cf. Morine-Dershimer 1978-79b)--serve as a mental plan for carrying out interactive teaching (cf. Joyce 1978-79; Morine-Dershimer 1978-79b). These images or plans are routinized so that once begun in the classroom they typically are played out (Joyce 1978-79; Morine-Dershimer 1978-79b), much as a computer subroutine is (cf. Shavelson 1976). Routines minimize conscious decision-making during interactive teaching (Clark and Yinger 1979; Joyce 1978-79; MacKay 1977; MacKay and Marland 1978; Morine-Dershimer 1978-79b) and so the "activity flow" (Joyce 1978-79) is maintained. Moreover, from an information-processing perspective, the routinization of behavior makes sense. Routines reduce the amount of information teachers have to consider and the number of decisions they

have to make by rendering the timing and sequencing of activities and students' behavior predictable within an activity flow. Hence, conscious monitoring of instruction can then focus on particular students (Connors 1978; MacKay 1977; MacKay and Marland 1978; Marland 1977; Morine-Dershimer 1978-79b) and on deviations of the lesson from the original plan (e.g., Clark and Yinger 1979; Joyce 1978-79; Peterson and Clark 1978).

Decision-making during interactive teaching, then, usually arises when the teaching routine is not going as planned (cf. Clark and Yinger 1979; Joyce 1978-79; MacKay 1977; MacKay and Marland 1978). Usually on the basis of lack of student involvement or behavior problems, teachers judge that the lesson is problematic (e.g., Peterson and Clark 1978) and may choose to: (a) continue the lesson or (b) change the lesson (Joyce 1978-79; Peterson and Clark 1978; Snow 1972). Typically, teachers choose not to change the lesson (Clark and Yinger 1979; Joyce 1978-79; Peterson and Clark 1978). In some cases, this choice is based on a decision to deal with the problem in future plans (cf. Joyce 1978-79; Peterson and Clark 1978). This tactic seems reasonable since, if the expectation is set up that the teacher will continually change a lesson, management of students and instructional tasks may become problematic.

Morine-Dershimer (1978-79b p. 86) has aptly captured the nature of decisionmaking during interactive teaching.

> For the lessons examined in detail here, when there was little or no discrepancy between teacher plan and classroom reality, teacher information processing was "image-oriented," with teacher recall of previous knowlege about pupils playing an important part. Decision points were handled by established routines. When there was a minor discrepancy between teacher plan and classroom reality, teacher information processing was "reality-oriented," with a fairly narrow range of pupil

behavior being observed. Decision points were handled by "in-flight" decisions. When a more pervasive discrepancy between teacher plan and classroom reality was perceived, then teacher information processing was "problem-oriented," with teachers tapping a broader spectrum of information about pupils. When a large discrepancy existed, decisions were postponed to a later time.

A Model of Teachers' Interactive Decisionmaking

ert Figure
here)

A model of teachers' interactive decisionmaking is presented in Fig. 2. It is a synthesis of research by Joyce (1978-79), Peterson and Clark (1978), Shavelson (1976), and Snow (1972). It posits that teachers' interactive teaching may be characterized as carrying out well established routines. In carrying out the routine, the teacher monitors the classroom, seeking cues, such as student participation, for determining whether the routine is proceeding as planned. This monitoring is probably automatic as long as the cues are within an acceptable tolerance (e.g., student out-of-seat behavior during discussion), the teacher has to decide if immediate action is called for. If so, the teacher has to decide if a routine is availble for handling the problem. The teacher may take action based on a routine developed from previous experiences. If no routine is available, the teacher reacts spontaneously and then continues the teaching routine. If an immediate action is not called for, the teacher considers whether delayed action, say after the lesson or in future planning, is necessary. The teacher notes the action in memory and carries on his teaching routine. If no action is necessary, the teacher decides whether or not to retain the information and continues with his teaching routine.

Research on Teachers' Interactive Decisionmaking

Most of the research on teachers' decisions and behavior during interactive teaching has employed the method of stimulated recall. With stimulated recall, the researcher either audio- or videotapes a lesson. After the lesson (or after school, depending on scheduling), the tape is played back to the teacher by the researcher and the teacher is asked to describe covert mental activities that accompanied the overt behavior.

Research using stimulated recall consistently has found that teachers' plans serve as a mental script (cf. Abelson 1976) or image (Morine-Dershimer 1978-79b) which guides their interactive teaching. These images or scripts are routinized. Once begun, they typically are carried out. Hence, interactive teaching has been described in many studies as primarily carrying out a routine.

Moreover, this research has found that teachers are reluctant to change their routines, even if they are not proceeding as well as expected. When changes do occur, they typically are minor adjustments in the routine and not major revisions (i.e., "fine tuning;" Joyce 1978-79). However, this research does not reveal why the teachers are reluctant to change their plans (but see Peterson and Clark 1978). One possible reason is that the routine chosen during planning was judged, on the basis of experience and the nature of the task, to be better than any alternative routine available to the teacher. A second possible reason is that the current routine was the only one available and any hastily-developed routine might not be expected to fare as well. A third possible reason is that changing routines during a lesson introduces uncertainty, both for teachers and students. For teachers, this constitutes an information-processing burden and a decrease in

their ability to monitor participation and behavior in the class. For students, shifting routines might lead to their having difficulty following the flow of instruction and result in learning and classroom management problems (cf. Doyle 1980).

In sum, teachers' main concern during interactive teaching is to maintain the flow of the activity. To interrupt this flow to reflect on an alternative and consider the possibility of changing a routine drastically increases the information processing demands on the teacher and increases the probability of classroom management problems.

Studies of teachers' reports of their thoughts while teaching reveal that teachers attend to their mental script or image while teaching, and this focus of attention is broken only when their monitoring of the classroom indicates a potential problem or unexpected event. When a problem or unexpected event arises, teachers report becoming "aware of reality" (e.g., McNair 1978-79; McNair and Joyce 1978-79). Their attention then focuses on student behavior.

A very common script used by teachers during interactive teaching is one of structuring, soliciting, responding and reacting (Bellack, Kliebard, Hyman and Smith 1966), where teachers ask questions and students respond. Teachers using this script attend to subject matter in the script and to students. A decision is required when a student gives a somewhat unexpected response. In carrying out this script, teachers apply certain principles or routines regarding their interaction with students (Connors 1978; MacKay 1977; MacKay and Marland 1978; Marland 1977). One principle is termed compensation. The teacher attempts to compensate the alleged "have-nots" in their classes by favoring the shy, or low-achieving student in, for example, selecting

respondents to their questions. A second principle is strategic leniency, which entails being lenient with a student in need of special attention. A third principle is power sharing, where the teacher uses the informal power structure for dispensing his influence. A fourth principle is progressive checking, where the teacher checks on especially low-ability students' progress during interactions or on assigned tasks. And the fifth principle is suppressing emotions. Teachers systematically suppress their emotions in front of students because: (a) their emotions might be a catalyst for unmanageable student behavior; (b) their emotions, especially negative reactions toward students' responses, might harm the students' self-concepts; or (c) their emotions might lead to unjust treatment of different students.

Teachers regularly monitor the classroom as a way to evaluate a routine (e.g., Joyce 1978-79). A problem with a routine often is signaled by a lack of student participation or by unsanctioned behavior such as out-of-seat or noise. If the problem is serious enough, it may interrupt the routine (see Figure 1). This is the occasion for most decision-making during interactive teaching.

Most studies report that teachers' decision-making is not pervasive during interactive teaching (e.g., MacKay 1977; Marland 1977). However, MacKay reported that teachers made about 10 interactive decisions per hour and Morine-Dershimer and Vallance (1975) reported between 9.6 and 13.9 decisions per lession (!). Clearly, teachers make decisions during interactive teaching. In making decisions, teachers tended to consider only a few alternative courses of action. MacKay (1977) reported that teachers seldom considered more than two alternatives and Morine-Dershimer and Vallance reported means of between 2.2 and 3.2

alternatives per lesson for four different groups of teachers. Moreover, teachers tended not to critically evaluate the alternatives; rather, they sought confirmation for their choice (MacKay 1977; MacKay and Marland 1978; see Einhorn and Hogarth 1978, for a review of research on confirmation in judgment and decision-making).

Few studies have traced the teaching process from initial information through teacher characteristics and cognitive processes to planning and interactive teaching and the effects of these components of teaching on students' achievements and attitudes. One notable exception is a study by Peterson and Clark (1978). Twelve teachers taught a social studies unit (not previously taught by the teachers) to three different groups of eight junior high students who they did not know and on whom they had no other information. They found that teachers used information about student participation and involvement in the lesson to judge how well their lesson was going. They considered alternatives only when teaching was going poorly and changed strategies in about half the problematic situations. However, these changes usually were not major ones; rather, they were more like fine tuning of the original plan (cf. Joyce 1978-79).

Peterson and Clark (1978) also found that teachers high in verbal ability (measured by a vocabulary test) were more likely to generate alternative courses of action and to use a more complex decision strategy than were teachers low in verbal ability. Moreover, teachers high on reasoning ability and conceptual level were very likely to use a more complex decision strategy than teachers who scored low on these measures.

Correlations between measures of planning and interactive teaching replicated Zahorik's (1970) finding that planning exclusively directed to content and objectives may produce rigid instruction. That is, process-oriented teachers were more likely to change plans than content-oriented teachers.

Correlations between a measure of the complexity of teachers' reported interactive decisions and measures of student achievement and attitude were negative (!). Teachers who considered alternative teaching strategies and even changed strategy during teaching were associated with students lower in achievement and attitude. Note, however, that these teachers also experienced problems with their normal teaching routine and so had to consider alternatives. In contrast, teachers reporting that their teaching went as planned were associated with high student achievement. Those routines which maintained the flow of activity, then, were associated with higher student achievement.

In a review of four studies, Shavelson and Borko (1979; the studies were: Barr 1974, 1975; Russo 1978; Stern and Shavelson 1981) examined teachers' policies about grouping students for reading and traced the grouping decision through interactive teaching and student achievement. They reported that most teachers grouped students for reading on the basis of ability. However, a few teachers did not group students primarily due to a lack of materials and other resources. Once grouped, the group and not the individual student became the unit for planning instruction. Teachers' plans for low groups differed considerably from their plans for high groups. Procedures, decoding skills (reading aloud) and highly structured assignments were planned and carried out for low groups while flexibility in procedures and assignments and an

emphasis on comprehension skills were planned and carried out for high groups. During interactive teaching, the high groups were paced as much as 15 times faster than the low groups. And student achievement in the high groups was correspondingly higher than in the low groups.

V. ANNOTATED REFERENCES

Barr, How Children Are Taught To Read: Grouping and Pacing

Barr investigated the nature of first-grade teachers' grouping and pacing decisions. Twelve teachers from four schools were interviewed toward the beginning and the end of the school year to determine the composition of reading groups within their classrooms and the pace of reading instruction (number of basal stories read). Additional information about the teachers (e.g., prior first-grade teaching experience), pupils (e.g., standardized test scores) and teaching conditions (e.g., availability of instructional materials) also was obtained.

Barr found that prior to grouping for reading instruction teachers sought information about students' reading ability from observations of student behavior, reading work, readiness test scores and anecdotal reports. When teachers grouped students, they did so on the basis of reading ability, but teachers differed considerably in their decisions on whether to group and when to group for basal reading and phonics instruction. Barr speculated that these decisions were influenced by school characteristics such as availability of instructional materials, teacher characteristics such as conceptions about good reading instruction, and class characteristics such as the presence of a number of low-ability pupils.

Teachers had little trouble articulating the factors that influenced their grouping decisions; in contrast, teachers had much difficulty explaining conditions that influenced their pacing decisions. Barr identified three factors that appeared to affect pace: grouping decisions, group characteristics and teacher characteristics. When teachers decided to form ability groups, these groups were always paced at different rates while whole

class instruction proceeded at one rate. Higher-ability groups were paced faster than lower-ability groups. Groups comparable in ability were paced at different rates which suggested teacher characteristics influenced pace.

Barr, Instructional Pace Differences and Their Effect on Reading Acquisition

The purpose of Barr's study was to explore the effect of pacing during whole class and ability group basal instruction on the reading achievement of high, average, and low-aptitude students. Pacing was defined as the number of new basal words introduced to students within a certain time period. Barr predicted a higher level of learning for pupils who received group rather than whole class instruction because, in ability groups, pace is matched to each student's aptitude level.

To test this hypothesis Barr identified two groups of high, average, and low-ability first-grade pupils. While these groups were similar in many important respects such as SES, the format and pace of their basal instruction differed. One group received instruction as a whole class where the pace was the same throughout the school year while the second group was divided into three ability groups that were paced at very different rates. Barr compared students in the two groups on: a) the pace of their instruction, b) number of basal words learned, c) percent of basal words learned to words introduced, d) general word recognition, and e) passage comprehension.

The results indicated that in ability groups the pace was greater than in whole class instruction. As predicted, Barr found that average and high-aptitude students receiving group instruction learned significantly more basal words than children of the same ability receiving whole class instruction. Low ability students, however, learned the same number of words regardless of the instructional format. Average and high-aptitude

students in ability groups were given many more words to learn in a much shorter amount of time than students of comparable ability receiving whole class instruction. However, no meaningful difference was found between the middle and high-ability students who received whole class or group instruction on the percent of basal words learned to words introduced. Students with similar reading aptitude receiving whole class instruction did not differ from students taught in ability groups on standardized measures of general word recognition and passage comprehension.

Borko, An Examination of Some Factors Contributing to Teachers' Preinstructional Classroom Organization and Management Decisions

Borko examined the effects of educational beliefs, various cues about students (e.g., overall achievement), and estimates of students' academic competence, motivation and behavior on teachers' decisions. Forty-six public and private school teachers, primarily female, who had taught at the upper elementary level (grades 4-6) for at least a year participated in the study. Subjects began by completing a measure of educational attitudes that assessed their traditional-progressive educational beliefs. Teachers next were asked to assume the role of an educational consultant hired to assist fifth-grade teachers make instructional decisions. They then read descriptions of thirty-six hypothetical fifth-grade students. These descriptions systematically varied six student cues: a) sex, b) overall achievement, c) social competence, d) self-confidence, e) work habits, and f) ability to work independently. After reading each description, subjects were asked to make estimates concerning the student's academic competence, motivation and classroom behavior and to make seven decisions regarding classroom organization and management and long-term objectives for that student.

Borko found that teachers used a limited amount of information to estimate students' cognitive, affective and behavioral states. Teachers tended to rely on the single piece of information most relevant to each estimate (e.g., overall achievement was used to judge academic competence). Educational beliefs did not influence any estimate. In contrast, teachers' decisions about selecting content, tutoring, referrals for testing, and long-term social

competence and emotional growth goals were influenced by their educational beliefs. Teachers with strong traditional beliefs, for example, decided to give students less responsibility for planning their instruction than teachers with weaker traditional beliefs. Cues about students and judgments of students' academic, motivational and behavioral states also influenced teachers' decisions.

Brophy & Good, Teachers' Communication of Differential Expectations for Children's Classroom Performance: Some Behavioral Data

Brophy and Good assumed that teachers form different performance expectations for different students. The purpose of their investigation was to determine the processes by which teachers communicate these different expectations to individual children.

Four first-grade teachers from a small Texas school district were asked to rank order their pupils on achievement. These rankings were considered the teachers' expectations for their students' classroom performance. Three boys and three girls ranked very low and three boys and three girls ranked very high from each classroom were chosen for observation. On four days in each classroom two observers coded all dyadic interactions between teachers and individual children in the group selected for study.

The findings indicated that teachers communicated different performance expectations to different children through their classroom behaviors. Teachers, for example, tended to encourage quality performance from students for whom they held high performance expectations. They were also more likely to praise their work and to avoid criticism. In contrast, students for whom the teachers had low performance expectations were less likely to be encouraged to improve or to receive praise when they performed well. These students were criticized more often for incorrect answers.

Brophy & Rohrkemper, Teacher's Thinking About Problem Students

Brophy and Rohrkemper studied the nature of teachers' thoughts about problematic elementary school students. The authors asked fifty-four elementary school teachers to read vignettes about different types of typical problem behavior such as hyperactivity, aggressiveness and low achievement. After reading these accounts, teachers were asked to describe in their own words each problem student and how they would handle the situation. The authors hypothesized that teachers' thoughts about the students and teachers' perceived ability to handle the situations would vary depending on the degree to which the teacher maintained control over the situation.

The results supported this hypothesis. For problem situations where the teacher's authority definitely was threatened (aggressiveness) teachers perceived student behavior as under the student's control and intentionally committed whereas in situations where teachers lost control but maintained authority (hyperactivity), student behavior was viewed as unintentional and less controllable. In problem situations where neither the teacher's authority nor control over the student was jeopardized (low achieving student), teachers viewed the behavior as not under the student's control and unintentional and were more optimistic about their ability to affect a positive change in the behavior that would be lasting and would generalize to other situations. A model of teacher strategy construction for handling problem situations based on this notion of problem ownership and also cost-benefit analysis was discussed.

Byers & Evans, Using a Lens-Model Analysis to Identify the Factors in Teaching Judgment

Byers and Evans used a lens model analysis to study the accuracy of teachers' judgments of their students' reading preferences. In a lens modeling study three types of information are necessary: a) a criterion measure of the event being judged, b) a list of cues that predict the criterion measure, and c) an observer or judge who predicts the criterion measure. In this study students' choice of books was the criterion measure. Twenty-nine cues such as fiction, fantasy and peers were used to describe the books from which the pupils could choose; research has shown these cues predict students' choice of reading materials. Teachers also predicted their students' reading preferences.

Twenty-nine teachers and 227 K to 6th grade students participated in the study. Students were randomly selected from teachers' class lists, subject only to the restriction that there should be an equal number of males and females. Pupils chose their books from a brochure that contained descriptions of Scholastic Press books. After the students had made their selections, teachers were asked to identify, from the same brochure, the books they thought each of their students would prefer. Teachers had no knowledge of their students' choices.

To measure the overall accuracy of teachers' judgments, the agreement between a teacher's prediction of students' reading preferences and students' actual preferences was estimated. The results indicated teachers did not judge students' choice of reading materials very accurately. Teachers differed from students in the cues they used to select books indicating they were not very knowledgable about student's reading interests. As expected, students' reading interests varied widely over grade level and sex.

Clark, Gage, Marx, Peterson, Stayrook & Winne, A Factorial Experiment on Teacher Structuring, Soliciting and Reacting

The authors examined the effect of teachers' structuring, soliciting and reacting during group instruction on student achievement and attitude. Structuring consisted of telling students what was going to happen next. Soliciting was defined as teachers asking questions and students responding. Reacting was teacher feedback following students' responses. The authors prepared eight different ecology lessons for the study that systematically varied structuring (high or low), soliciting (high or low), and reacting (high or low).

Four experienced elementary school teachers and 408 middle-class, sixth-grade boys and girls participated in the study. Each of the four teachers was randomly assigned to teach eight ecology lessons to eight different groups of students. Each lesson was a different variation of the structuring, soliciting and reacting strategy. Prior to teaching, instructors received two weeks of training on the behaviors associated with high and low structuring, soliciting and reacting. In addition, teachers were given a lesson script. The script helped ensure that the subject matter presented to students and the teaching behaviors used were the same over all instructors and lessons. Students completed achievement and attitude pretests, posttests, and 3-week retention tests.

The results indicated that structuring, soliciting and reacting did affect student achievement. High achievement was associated with high structuring (e.g., stating objectives at the beginning of the lesson, outlining lesson content, indicating important points in the lesson), low soliciting (e.g., asking significantly more low order than high order questions), and

high reacting (e.g., praising correct student responses, providing explanations for incorrect responses). Student attitude toward ecology was not influenced by the treatment conditions. Despite control of teacher behavior and content covered, individual instructors still had different effects on student achievement.

Cooper, Burger & Seymour, Classroom Context and Student Ability as Influences on Teacher Perceptions of Classroom Control

The authors examined, in two slightly different studies, various factors that may influence teachers' perceptions of classroom control and successful instructional interactions. Fifty-six teachers, primarily female, who were enrolled in a graduate education course at a mid western university, participated in the first study. Teachers began by listing the initials of three of their high-ability and three of their low-ability students. Subjects then were presented with ten hypothetical instructional situations occurring in their classroom. These situations described an encounter between them and a student that was initiated either by them or the pupil, occurred while they were working with a group or an individual child, and involved either a high or low-ability youngster. After reading each description, teachers rated: a) their feelings of personal control over the subject matter during the interaction, b) perceived control over the length of the interaction, and c) the liklihood the encounter would end in success. While completing these ratings, teachers had been instructed to think about what the three previously-listed high-ability students had in common and characteristics the three low-ability students shared.

Thirty-three fourth-grade teachers, primarily female, participated in the second study. Procedures were identical to the first study except teachers also rated feelings of personal control over when the interaction would occur.

The results indicated that teachers in both studies tended to perceive more personal control during interactions with high-ability students than during interactions with low-ability students. Teachers also predicted that encounters with high-ability students would be more likely to end in success. Subjects generally believed that

teacher-initiated interactions allowed them greater control over when an interaction would occur and what was discussed during the encounter. Teachers' perceived control over the length of an interaction was influenced by the number of children with whom they were working at the time the interaction occurred.

Ericsson, Chase & Faloon, Acquisition of a Memory Skill

Research indicates short-term memory is limited to about seven unrelated items but case histories document that particular individuals have remembered much larger amounts of information. From these histories it is unclear whether such memory feats are the result of exceptional innate ability or extensive practice. The purpose of this study was to determine how a memory skill was acquired.

A college undergraduate with average intelligence and memory skills practiced a memory span task approximately an hour a day 3 to 5 days a week for 20 months. The task called upon the student to repeat random number sequences. When he responded correctly, the length of the next sequence was increased by one number, whereas when he responded incorrectly, the sequence was decreased by one. Toward the middle of each hour session the subject verbally reported his thoughts during a practice trial. At the conclusion of each session he recalled as many number sequences as possible.

Over the course of the study, through the use of mnemonic devices and organizational techniques, the student increased his recall of numbers from 7 to 79 digits. In addition, his ability to remember material from the session increased from zero to 80%. The authors concluded that extensive practice can lead to unlimited improvement in memory skills. This improvement is due to the use of mnemonic associations in long-term memory. The working capacity of short-term memory is not increased with practice. At the end of the experiment the subject still could hold only about 6 digits in short-term memory.

Floden, Porter, Schmidt, Freeman & Schwille, Responses to Curriculum Pressures: A Policy-Capturing Study of Teacher Decisions About Content

The authors examined the extent to which outside pressures altered teachers' selection of content for fourth-grade mathematics instruction. Subjects were sixty-six midwestern urban, suburban and rural school teachers, primarily female, who had taught fourth-grade mathematics for some time. Teachers were asked to assume the role of a mathematics teacher new to a school who was aware that his/her students could master the fourth-grade mathematics curriculum. They then read thirty hypothetical stories related to choice of their instructional content. These vignettes systematically varied the presence or absence of six external pressures on the teacher to modify his/her curriculum: a) mandated textbooks, b) a district-imposed set of instructional objectives, c) district tests, d) principal-initiated discussions regarding the curriculum, e) teachers' opinions, and f) parental input. After reading each story, the teachers were asked to rate whether they would incorporate five new topics into their curriculum and whether they would omit five other topics usually covered.

The results indicated that subjects modified their instructional content regardless of the source of amount of pressure. Even with only a single pressure present, teachers, on the average, indicated they would incorporate the five new topics. District objectives and tests had much greater effects than the other four factors on teachers' decisions to add topics. The authors also found that teachers were reluctant to omit topics.

Florio, The Problem of Dead Letters: Social Perspectives on the Teaching of Writing

Florio examined writing instruction in a second-grade classroom in a small midwestern community. Mrs. Frank, the teacher, had created a community, Betterburg, within her room. Betterburg dominated the physical space and the social life in the classroom and served as the basis for instruction. The second-grade pupils were the inhabitants of Betterburg. They made the laws and ensured that all aspects of the town, such as commerce, cultural activities and the postal service, were operational.

Florio defined effective writing instruction as getting students to write. She hypothesized that, while it is generally difficult to get students writing in school, writing in Mrs. Frank's classroom would not be avoided because it was connected to something meaningful to the children, the existence of their community. The findings supported this hypothesis. During the year the author observed the children, she found that they wrote often and produced a variety of documents. In particular, students wrote letters concerning Betterburg almost daily. When interviewed at the end of the year about their school activities, the only writing activity pupils explained in detail was letter writing. Through these letters children engaged in a variety of writing activities that involved the practice of a wide range of skills such as self-expression, persuasive writing, spelling and punctuation. This study illustrates the importance of establishing a sense of community in the classroom.

Gil, The Decision-Making and Diagnostic Processes of Classroom Teachers

Gil studied, in an experimental and classroom setting, teachers' diagnoses of children's reading problems. Ten mid-western teachers who had taken at least two university courses in the teaching of reading participated in the study. Teachers first diagnosed two simulated cases of students with reading difficulties. Subjects then were interviewed about their classroom reading diagnoses. Data analysis consisted of product measures (the results of teachers' interactions with cases), process measures (the manner in which teachers diagnosed cases), and frequency measures (the diagnostic categories most often mentioned during teacher interviews).

Gil found that teachers lacked comprehensive, systematic strategies for collecting and using information to reach diagnostic decisions. Comparisons between teachers' classroom and laboratory diagnoses revealed that teachers offered the same non-specific, global and incomplete diagnoses in both settings. Teachers did not agree with each other on the process to determine the nature of the reading problem for a case or on their final diagnostic judgments for a case. Gil concluded that teachers need to be trained more thoroughly in reading diagnosis.

Hammond & Adelman, Science, Values and Human Judgment

The purpose of this article was to illustrate how scientific facts and social values can be integrated successfully though the scientific study of human judgment. Other approaches to integrate scientific information and social values, the adversary system and the person-oriented approach, are inadequate because both methods are ascientific and focus on persons rather than methods. The underlying assumption of the scientific approach toward the study of judgment is that judgment is a human cognitive activity that can be scientifically analyzed and improved.

The authors presented, through an example, the framework of a scientific method for integrating scientific information and social values. The example involved a dispute over the appropriate handgun ammunition for the Denver Police Department. First, policy-makers and community members were asked to make social value judgments regarding the relative desirability of hypothetical bullets described in terms of severity of injury, threat to bystanders and stopping effectiveness. Next, a panel of scientific experts provided, through the use of objectively measurable variables such as weight and muzzle velocity of the bullet, information regarding the severity of injury, threat to bystanders and stopping effectiveness of eighty bullets. Scientific and social value judgments then were scientifically combined to reach social judgments regarding the acceptability of different bullets. The overall acceptability of a bullet was an additive combination of: a) the weight or relative importance policy-makers placed on stopping effectiveness multiplied by expert judgments regarding stopping effectiveness, b) the weight policy-makers placed on injury multiplied by expert judgments regarding injury, and c) the weight policy-makers placed on threat to

bystanders multiplied by expert judgments regarding the threat. In sum, the essential elements of a scientific methods for integrating scientific information and social values are objectively measurable variables, social value judgments by policy-makers or community representatives, scientific judgments regarding the effects of different alternatives, and the analytic integration of the social values and scientific facts.

MacKay & Marland, Thought Processes of Teachers

MacKay and Marland used stimulated recall to investigate the nature of teachers' thoughts during instruction. In a stimulated recall study, teachers' lessons are audio- or videotaped. Sometime shortly after the lesson, the researcher plays back the tape to the teacher and helps the instructor recall the thoughts and feelings that accompanied his/her behavior.

Six teachers, one from each of the first, third and sixth grade levels in two urban Canadian schools, volunteered to participate in this study. Before videotaping, teachers were interviewed about their lesson goals and how they intended to achieve them. Recordings of two, one-hour lessons then were made in each classroom. At the end of the school day, tapes were played back to teachers to stimulate recall of their mental activity during each lesson.

The authors developed a system to analyze this verbal report data. Teachers' thoughts first were placed into one of 11 categories such as reflections or feelings. The frequencies of thoughts in each category for each lesson were represented as percentages of the total number of interactive thoughts in each lesson. This data also was examined for the occurrence of phenomena such as decisions or principles.

The authors reported that, in general, teachers thought mostly about their next instructional tactic and what had already occurred in the lesson. Subjects rarely pondered their lesson plans during instruction. However, they did reflect on lesson content which suggests instructors were monitoring lessons to see that they were proceeding as planned. Teachers made approximately 10 decisions per lesson, usually considering two alternatives per decision. In implementing their lessons, teachers applied numerous teaching

principles regarding their interaction with pupils, such as compensating the have-nots and suppressing emotions.

McArthur, The How and What of Why: Some Determinants and Consequences of Causal Attribution

McArthur investigated how causal attributions are formed. Causal attributions are the perceived reasons for why events occur. In an academic setting common student attributions for failure on tests are the teacher made the exam too hard and the student didn't study. Attribution theorists have proposed that people form attributions on the basis of three types of information: a) consistency (generality of the actor's behavior across different contexts), b) distinctiveness (generality of the behavior across entities), and c) consensus (generality of the behavior across other actors). The primary purpose of this study was to determine whether different causal attributions are the result of various combinations of distinctiveness, consensus and consistency information.

Ninety-five male undergraduates at an eastern university participated in the study. Subjects filled out a 16-item questionnaire. Each item described a response made by another person (e.g., John laughs at the comedian). For the experimental subjects, accompanying each response were three statements representing one of eight possible combinations of high or low consistency information, high or low distinctiveness information and high or low consensus information. For example, after the response John laughs at the comedian, the following pattern of information might appear: 1) In the past John has almost always laughed at the same comedian (high consistency), 2) John also laughs at almost every other comedian (low distinctiveness), and 3) Hardly anyone who hears the comedian laughs at him (low consensus). For control subjects no information regarding the response was given. All subjects then were asked to indicate whether something about the actor (e.g., John), something about the stimulus entity

(e.g., the comedian), something about the particular circumstances, or some combination of these three factors caused the response (e.g., laugh) to occur.

The results indicated various information combinations lead to different attributions. Attributions to the actor, for example, occurred where there was high consistency, low distinctiveness and low consensus information whereas stimulus attributions arose when there was high consistency, high distinctiveness and high consensus. Distinctiveness information had the greatest effect on both person and stimulus attributions.

McNair, Capturing Inflight Decisions: Thoughts While Teaching

McNair used stimulated recall to study what teachers think abou while they teach. Ten elementary school teachers were videotaped twice during the fall, winter and spring of a school year. At all three time periods videotapes were made of each teachers' morning (low ability group) and afternoon (high ability group) reading lessons. Data analysis consisted of determining the frequency of and categorizing particular types of thoughts.

McNair reported that while teachers' thinking could be divided into five major categories of concerns (pupil, content of lesson, procedures, time, and materials), teachers tended to concentrate mainly on two categories--the pupil and lesson content. Within the pupil category, the sub-category of pupil learning was uppermost in teachers' minds, and for lesson content, the sub-category of task was of greatest concern. Pupil learning addressed those concerns related to students' understanding of the material. Task encompassed teacher statements that expressed concern over the learning activity in which the group was engaged. Teacher concerns were not affected by time of year or group ability level.

McNair concluded that teachers' thoughts during interactive teaching were centered on the "fine tuning" of the activity in which the group was engaged. Teachers interacted with students to see that the activity was going as planned. They made slight adjustments (fine tuning) during the lesson to maintain the orderly flow of activities.

Morine-Dershimer, How Teachers "See" Their Pupils

The author investigated the effect of instructional context on teacher conceptions of pupils. Previous research indicated that three particular aspects of instructional context helped shape teacher conceptions of students: time of year (e.g., first day of the school year), observational setting (e.g., general class instruction), and curriculum-management system (e.g., individualized instruction). Morine-Dershimer systematically studied the relation of these three contextual variables to teacher conceptions of pupils.

Ten elementary school teachers were asked to complete a categorizing task five times during a school year. The task consisted of sorting a deck of cards containing the names of the teacher's students into piles, based on perceived similarities and differences among the students. Pupils grouped together were perceived "to behave or respond in similar ways". Teachers were not restricted to any specific number of piles or any particular number of students within a pile. After completing the card sorting task, teachers were asked to describe the characteristics of each group and to explain how the groups differed from one another. Data were collected at different points in the school year and were gathered after general instruction and after specific reading lessons so that time of year and observational setting would be systematically varied. Data analysis consisted of examining the effects of the contextual variables on three aspects of teacher conceptions of students: content (types of pupil characteristics identified during card sorts), logical structure (logical student groupings formed during the sorts such as singling out students), and valence (positive, neutral and negative

labels used to distinguish among student groups).

The results indicated that teacher conceptions of pupils were affected by three contextual variables, primarily time of year but also observational setting and curriculum-management system. Teachers, for example, tended to focus on particular types of student characteristics at different times in the school year. At the end of the first day of school, when teachers were getting to know their students, the focus was on pupil personality whereas, at midyear, when the emphasis was on the instructional program, teachers more frequently mentioned pupil involvement in instruction. Logical structure also was influenced by time and curriculum-management system. The affective nature of teacher conceptions was influenced mostly by time. Negative affective labels peaked in November and then decreased while neutral labelling increased over the year and positive labelling remained constant all year long.

Peterson, Marx, & Clark, Teacher Planning, Teacher Behavior, and Student Achievement

Peterson, Marx & Clark investigated individual differences in teacher planning, the extent to which instructors teach what they planned to teach, and the effect of planning on student achievement and attitude. Twelve experienced elementary school teachers (6 female and 6 male) and 288 junior high school students participated in the study. Thirty-six groups with eight students per group were formed randomly from the sample of students. Each teacher taught the same social studies lesson to three different groups on three different days. Teachers did not know the students and were not provided with any background information about them.

Two weeks before the study began, measures of the teachers' verbal and reasoning ability, flexibility of closure and conceptual level were collected. Three days prior to teaching, instructors were given eleven cognitive and affective objectives and the social studies text material. Ninety minutes were reserved each day before teaching for the subjects to plan the day's lesson. Teachers were asked to think aloud while they planned each lesson, and their verbalizations were tape-recorded. To assess the outcomes of instruction, at the end of the day, students completed a multiple choice achievement test, an essay achievement test and an attitude questionnaire.

The results indicated that, during planning, teachers focused on the content (subject matter) to be taught and instructional processes (student learning activities, teacher strategies, teacher activities) but hardly considered objectives. Individual differences in teacher planning were related to teacher aptitudes. Teachers high on conceptual level, for example, directed more planning

statements to instructional process and the learner whereas teachers low on conceptual level tended to make more planning statements and more of these statements focused on lower order subject matter. Teachers, in general, instructed in a manner consistent with what they talked about during planning. Teacher effectiveness in relation to student achievement and attitude tended to decrease from the first to the third day of instruction. Furthermore, after the first day of teaching, instructors who were the more prolific planners were less effective in promoting student achievement and also received lower student attitude scores for all three days.

Prawat, Teachers' Perceptions of Student Affect

To examine the nature of teachers' perceptions of students' emotional classroom responses, Prawat asked eighty-four elementary school teachers to describe, focusing on students' affective behavior, five typical situations involving students that had occurred in their classroom. Background information on the teachers also was gathered.

The written vignettes were analyzed to determine over all stories such information as: a) the main actor in the events, b) the teachers' primary emotional response, c) the context in which the events occurred, and d) whether teachers viewed the situations they described as problems and, if they did, whether the problems were perceived as resolvable or unresolvable and long or short-term. The results indicated that teachers focused on group affect as well as individual emotions. Teachers' first emotional response was inferred to be more reflective than impulsive. The most often cited context for an event was an instructional activity. Teachers tended to view the situations they described as long-term problems that could be resolved through positive verbal intervention rather than punishment. Teachers' perceptions were influenced by individual differences such as years of teaching experience.

Shavelson, Cadwell & Izu Teachers' Sensitivity to the Reliability of Information in Making Pedagogical Decisions

The authors examined teachers' sensitivity to the reliability of their information when making initial estimates of student ability and instructional decisions, and their willingness to revise these estimates and decisions when presented with additional information which was either reliable or unreliable. One-hundred-sixty-four graduate students in education at a large west coast university, the majority of whom were teachers, participated in the study.

Subjects began by reading a story about Michael, a fifth-grade student who lived with his family. These stories differed in terms of the reliability and valence of the information regarding Michael's socio-economic status, use of time and intelligence. This information was either reliable (obtained from an interview with Michael's parents or an intelligence test) or unreliable (based on an interview with a classmate who hardly knew him) and paired a positive (high SES, intelligent, hard-working child) or negative (low SES, low-ability child who wastes time) picture of Michael. After reading and thinking about the story, subjects were asked to estimate the probability this pupil would obtain high grades on his report card and to make three instructional decisions. Subjects then were given additional reliable or unreliable and positive or negative information about Michael's academic ability, curiosity and attitude toward school and were asked to revise their initial estimates of the student's future academic performance and instructional decisions based on this new information.

The results indicated that teachers were sensitive to the reliability of the information they received and were willing to

revise their initial ability judgments and instructional decisions when given more information. These findings suggest that teachers are good decision-makers.

Sherman & Brown, Training Reading Specialists in Diagnosis

Sherman and Brown used Inquiry Theory to help improve the clinical performance of reading specialists. The Inquiry Theory of Clinical Problem Solving states that the interaction of clinician and case is determined by the clinician's memory and strategy. The clinician's memory consists of a set of problems, cues, treatments and the relationships among them. The clinical strategy is the sequence of mental tasks which translates memory into action. According to the Instructional Collary of Inquiry Theory, the clinical performance during an interaction can be improved by alterations in memory and strategy. The purpose[5] of Sherman and Brown's study were: a) to determine if clinical memory and strategy were related to performance in diagnosis, and b) to see if clinical memory and strategy could be manipulated to improve diagnostic performance.

Thirty-six reading specialists and teachers enrolled in a graduate reading diagnosis course at a midwestern university participated in the study. Subjects first were given a pretest which included a Memory Battery Association Test and a Diagnostic Performance Test. They then received thirty hourse of clinical training and practice in diagnosis. At the end of the five weeks of instruction subjects were posttested on the same battery of tests.

The test results indicated significant improvement in clinical memory and diagnostic performance at the end of training . No measures of clinical strategy changes were provided. The authors concluded that clinical memory and diagnostic performance were related, and clinical memory could be manipulated to enhance diagnostic performance.

Stern & Shavelson, The Relationship Between Teachers' Grouping Decisions and Instructional Behaviors: An Ethnographic Study

Stern and Shavelson examined, in a natural setting, teachers' policies about grouping students for reading instruction and the effect of grouping on subsequent instructional behavior. Other investigators had examined these issues in settings outside the classroom but no one systematically had observed teachers in their classroom as they formed reading groups and carried out instruction.

The authors observed whole class and small group reading instruction in a fifth-sixth grade classroom at a university-affiliated elementary school. Once the class was grouped for instruction during the third week of the school year, the ten students (six boys and four girls) who were members of the lowest reading group and the ten students (six girls and four boys) who were members of the highest reading group and their two female teachers became the focus of the authors' observations. They were observed forty-five minutes a day, on an average of two days a week, over a six month period. Throughout the study informal and formal interviews were conducted with the two teachers who instructed the highest and lowest ability groups.

The results were consistent with findings from related laboratory and survey research. Teachers grouped students primarily on the basis of reading ability. Once grouped the group and not the individual student became the unit for planning instruction. Teachers' lesson plans for the lowest group differed greatly from their plans for the highest group. Procedures, reading aloud and basic comprehension skills were emphasized during instruction for

the low-ability group whereas student discussion, writing and more sophisticated comprehension skills were stressed during meetings of the high-ability group. Furthermore, students in the low group always received much more rigidly structured assignments than students in the high group.

Stevenson, Parker, Wilkinson, Hegion & Fish, Predictive Value of of Teachers' Ratings of Young Children

The authors explored the ability to predict students' scholastic performance during the early years of elementary school from teachers' ratings of children's cognitive abilities, work habits, and personal-social characteristics. Sixty-three K through third-grade teachers and approximately 200 students participated in the study. Kindergarten teachers rated 217 children at the beginning and the end of the kindergarten year. At the conclusion of the second grade, teachers rated 134 of the same children, and at the end of the third grade, 146 children were rated. Kindergarten and second-grade rating scales were the same. The variables for the rating scales were of three types: "those related to cognitive abilities such as learning and memory, to classroom skills such as working hard and paying attention, and to personal-social characteristics such as social acceptance and adaptation to new situations." The only change in the third-grade ratings was the addition of more scales related to personal-social characteristics.

At the end of the second grade, mothers of 116 of the students rated their children on most of the characteristics rated by their teachers, and, at the end of the third grade, 111 mothers rated their children on the same variables rated by the second-grade mothers. Before kindergarten and at the end of each grade students' achievement in reading and mathematics was assessed by the Wide Range Achievement Test.

The results indicated that teachers' ratings predicted early school performance. By the beginning of kindergarten, for example, teachers' ratings predicted third-grade scholastic achievement. Ratings of cognitive abilities were of the most utility in pre-

dicting future academic performance. The sum of four cognitive ability variables (effective learning, retaining information, vocabulary, and following instructions) predicted achievement almost as well as the entire battery of ratings. Mothers' ratings did not predict children's achievement as effectively as the ratings made by teachers.

Vinsonhaler, The Consistency of Reading Diagnosis

Vinsonhaler, using an "Inquiry Theory" of clinical problem solving as the basis of his research, studied the agreement of reading clinicians' diagnoses of reading problems. Inquiry Theory assumes that diagnostic decisions are determined by a case (a simulated case of a student with a reading problem frequently encountered in the public schools or an actual student experiencing a common reading difficulty), clinical memory and clinical strategy. The Agreement Corollary of Inquiry Theory states that the greater the similarity of clinical memory for a particular case and particular set of clinicians, the greater the degree of diagnostic agreement. The Agreement Corollary also predicts that group agreement (measures of agreement involving the comparison of individual diagnoses with group diagnoses) should be greater than or equal to intra-clinician agreement (measures of agreement of an individual's diagnosis with his diagnosis on an equivalent form of the same case) or inter-clinician agreement (measures of agreement between clinicians for the same case). Intra-clinician agreement also is predicted to be greater than inter-clinician agreement.

Eight experienced and highly-respected reading clinicians from the mid-Michigan area were selected to participate in the study. Subjects collected data and wrote a diagnostic report for three simulated cases (the first and third cases were equivalent forms). Each clinician received a case a week. The researcher then computed measures of group, intra-clinician and inter-clinician agreement for both the type of information gathered prior to diagnosis and the final diagnostic judgments.

Vinsonhaler found a reasonable level of group agreement on diagnostic judgments. As predicted by the Agreement Corollary, the mean group agreement was greater than the mean intra-clinician or mean inter-clinician agreement, and the mean intra-clinician agreement was greater than the mean inter-clinican agreement. Both inter- and intra-clinician agreement, however, were very low. Expert clinicians did not agree with themselves or with each other on diagnosis. Subjects showed a higher level of agreement with themselves and other clinicians on the types of information gathered prior to diagnoses than on diagnoses.

Zahorik, The Effect of Planning on Teaching

Zahorik examined whether teachers who planned a lesson were more sensitive and responsive to students during instruction than teachers who did not plan. Twelve fourth-grade teachers from four suburban schools participated in the study. Six teachers, selected randomly, were given two weeks to plan a lesson on credit cards while the remaining six teachers received the topic immediately before they were to begin instruction. Transcripts of all twelve lessons were analyzed to determine if teachers who planned genuinely prompted more student ideas, praised more student responses and solicited more student discussion than teachers who did not plan.

The results indicated that teachers who had been given time to plan the lesson were less likely to permit, encourage and develop students' ideas than teachers who had not planned. On the basis of these findings, Zahorik concluded that teachers who planned were less sensitive to students' ideas. He speculated that planning may result in such strict adherence to objectives, activities and content that teachers forget about student input. Ideas regarding ways to remind instructors to be more responsive to students were discussed.

REFERENCES

Abelson R P 1976 Script Processing in Attitude Formation and Decision Making. In Caroll J S and Payne J W (Eds.). Cog. & Soc. Beh, Lawrence Erlbaum, Hillsdale, N. J.

Barr R 1975 How Children are Taught to Read: Grouping and Pacing. School Rev. 83: 479-498.

Barr R 1974 Instructional Pace Differences and Their Effect on Reading Acquisition. Reading Res. Quart. 9: 526-554.

Bellack A A, Kliebard H M, Hyman R T, and Smith F L Jr. 1966 The Language of the Classroom. Teachers' College Press, New York.

Borko H 1978 An Examination of Some Factors Contributing to Teachers' Preinstructional Classroom Organization and Management Decisions. Paper presented at the annual meeting of the Amer. Educ. Res. Assoc., Toronto, Ontario.

Borko H, Cone R, Russo N A and Shavelson R J 1979 Teachers' Decisionmaking. In Peterson P L and Walberg H J (Eds.), Research on Teaching: Concepts, findings and implications. McCutchan, Ca.

Borko H and Shavelson R J 1978 Teachers' Sensitivity to the Reliability of Information in Making Causal Attributions in an Achievement Situation. J. Educ. Psych. 70: 271-279.

Brophy J E and Good T L 1970 Teachers' communication of differential expectations for children's classroom performance: Some behavioral data. J. Educ. Psych. 61: 365-374

Brophy J E and Rohrkemper M M January 1980 Teachers Thinking About Problem Students. (Research Series No. 68), Institute for Research on Teaching, Michigan State University.

Byers J L and Evans T E April 1980 Using a lens-model analysis to identify factors in teaching judgment. Research Series No. 73, Institute for Research on Teaching, Michigan State University.

Cadwell J 1980 Alternative Regression Models of Teacher Judgment and Decision Making. Paper presented at the annual meeting of the American Educational Research Association, Boston, Mass.

Carnahan R S May 1979 Planning. In Romberg T A, Small M and Carnahan R S (Eds.). Research on Teaching from a Curricular Perspective, Conceptual Paper No. 6, Wisconsin Research and Development Center for Individualized Schooling.

Clark C 1978-79 A New Question for Research on Teaching. Educ. Res. Quart. 3: 53-58.

Clark C and Elmore J L 1979 Teacher Planning in the First Weeks of School. Research Series No. 55, Institute of Research on Teaching, Michigan State University.

Clark C, Gage N L, Marx R, Peterson P L, Stayrook N G and Winnie P A 1979 A Factorial Experiment on Teacher Structuring, Soliciting, and Reacting. Journal of Educational Psychology. 7: 534-552.

Clark C, Wildfong S and Yinger R 1978 Identifying Cues for Use in Studies of Teacher Judgment. Research Series No. 23, Institute for Research on Reading, Michigan State University.

Clark C M and Yinger R J 1977 Research on Teacher Thinking. Curr. Inq. 7: 279-394

Clark C and Yinger R 1979 Teachers' thinking. In Peterson P L and Walberg H J (Eds.), Research on Teaching: Concepts, findings and implications. McCutchan, Berkeley, Ca.

Clark C M and Yinger R J 1977 Teachers' Thinking. In Peterson P L and Walberg H J (Eds.), Research on Teaching, McCutchan, Berkeley, Ca.

Conners R D 1978 An Analysis of Teacher Thought Processes, Beliefs and Principles During Instruction. Ph.D. dissertation, Department of Elementary Education, University of Alberta.

Cooper H M, Burger J M and Seymour G E 1979 Classroom Context and Student Ability as Influences on Teacher Perceptions of Classroom Control. Amer. Educ. Res. J. 16: 189-196.

Doyle W March 1980 Student Mediating Responses in Teaching Effectiveness: Final Report, Project No. 0-0645, Department of Education, North Texas State University.

Doyle W 1979 Classroom Tasks and Students' Abilities. In Peterson P L and Walberg H J (Eds.), Research on Teaching: Concepts, findings and implications, McCutchan, Berkeley, Ca.

Dusek J B 1975 Do teachers bias children's learning? Rev. Educ. Res. 45: 661-684.

Einhorn H J and Hogarth R M 1981 Behavioral decision theory: Processes of judgment and choice. Ann. Rev. Psych. 32: 53-88.

Einhorn H J and Hogarth R M 1978 Confidence in Judgment: Persistence of the Illusion of Validity. Psych. Rev. 85: 395-416.

Einhorn H J, Kleinmuntz D N and Kleinmuntz B 1979 Linear Regression and Process-Tracing Models of Judgment. Psychological Review. 86: 465-485.

Erickson F March 1979 "Mere" Ethnography: Some Problems in Its Use in Educational Practice. (Occasional Paper No. 15), Institute for Research on Teaching, Michigan State University.

Erickson F March 1979 On Standards of Descriptive Validity in Studies of Classroom Activity. (Occasional Paper No. 16), Institute for Research on Teaching, Michigan State University.

Ericsson K A, Chase W G and Faloon S 1980 Acquisition of a Memory Skill. Science. 208: 1181-1182.

Ericsson K A and Simon H A 1980 Verbal Reports as Data. Psychological Review. 87: 215-251.

Fenstermacher G D 1980 What Needs to Be Known About What Teachers Need to Know? In Hall G E, Hord S M and Brown G (Eds.), Exploring Issues in Teacher Education: Questions for Future Research. Research and Development Center for Teacher Education, Austin, Texas.

Filstead W J 1970 Qualitative Methodology. Markham, Chicago, Illinois.

Floden R E, Porter A C, Schmidt W H, Freeman D J and Schwille J R April 1980 Responses to Curriculum Pressures: A Policy Capturing Study of Teacher Decision about Content. (Research Series No. 74), Institute for Research on Teaching, Michigan State University.

Florio S 1979 The Problem of Dead Letters: Social Perspectives on the Teaching of Writing. The Elem. School J. 80: 1-7.

Gil D March 1980 The decision-making and diagnostic processes of classroom teachers. Research Series No. 71, Institute for Research on Teaching, Michigan State University.

Hammond K R and Adleman L 1976 Science, Values and Human Judgment. Science. 194: 389-396.

Janesick V J November 1978 An Ethnographic Study of a Teacher's Classroom Perspective: Implications for Curriculum, Research Series No. 33, Institute for Research on Teaching, Michigan State University.

Janis I L and Mann L 1977 Decisionmaking. Free Press, New York.

Joyce B 1978-79 Toward a Theory of Information Processing in Teaching. Educ. Res. Quart. 3: 66-67.

Kelley H H and Michela J L 1980 Attribution theory and research. Ann. Rev. Psych. 31: 457-501.

MacKay A 1977 The Alberta Studies of Teaching: A Quinquereme in Search of Some Sailors. CSSE News. 3: 14-17.

MacKay D A and Marland P February 1978 Thought Processes of Teachers. Paper presented at the annual meeting of the Amer. Educ. Res. Assoc., Toronto.

Marland P W 1977 A Study of Teachers' Interactive Thoughts. Unpublished doctoral dissertation, University of Alberta.

McArthur L Z 1972 The How and What of Why: Some Determinants and Consequences of Casual Attribution. Journal of Personality and Social Psychology 22: 171-193.

McNair K 1978-79 Capturing inflight decisions: Thoughts while teaching. Educ. Res. Quart. 3: 26-42.

McNair K and Joyce B 1978-79 Thought and Action, a Frozen Section: The South Bay Study. Educ. Res. Quart. 3: 16-25.

Mintz S L April 1979 Teacher Planning: A Simulation Study, Paper presented at the annual meeting of the Amer. Educ. Res. Assoc., San Francisco, Ca.

Morine G 1976 A Study of Teacher Planning. Beginning Teacher Evaluation Study, Far West Laboratory, San Francisco, Ca.

Morine-Dershimer G 1978-79a How Teachers "See" Their Pupils. Educ. Res. Quart. 3: 83-99.

Morine-Dershimer G 1978-79b Planning in Classroom Reality, an In-Depth Look. Educ. Res. Quart. 3: 83-99.

Morine-Dershimer G 1978-79c The Anatomy of Teacher Prediction. Educ. Res. Quart. 3: 59-65.

Morine-Dershimer G and Vallance E November 1975 A Study of Teacher and Pupil Perceptions of Classroom Interaction. Technical Report 75-11-6, Beginning Teacher Evaluation Study, Far West Laboratory, San Francisco, Ca.

National Institute of Education 1975 Teaching as Clinical Information Processing. Report of Panel 6, National Conference on Studies in Teaching, National Institute of Education, Washington, D.C.

Nisbett R and Ross L 1980 Human influence: Strategies and shortcomings of social judgments. Prentice-Hall, Englewood Cliffs, N. J.

Nisbett R E and Wilson T D 1977 Telling More Than We Can Know: Verbal Reports on Mental Processes. Psychological Review. 84: 231-259.

Peterson P L, and Clark C M 1978 Teacher Planning, Teacher Behavior, and Student Achievement. School of Education, University of Wisconsin.

Peterson P L, Marx R W and Clark C M 1978 Teacher Planning, Teacher Behavior, and Student Achievement. Amer. Educ. Res. J. 15: 417-432.

Prawat R S 1980 Teacher Perceptions of Student Affect. American Educational Research Journal. 17: 61-73.

Rist T C 1979 On the Means of Knowing: Qualitative Research in Education. New York University Education Quarterly. 19: 17-21.

Russo N A 1978 Capturing Teachers' Decision Policies: An Investigation of Strategies for Teaching Reading and Mathematics. Paper presented at the annual meeting of the Amer. Educ. Res. Assoc., Toronto, Ontario.

Schank R and Abelson R P 1977 Scripts Plans, Goals and Understanding: An Inquiry into Human Knowledge Structures. Lawrence Erlbaum, Hilladale, N. J.

Schwab J J 1962 The Concept of Structure of a Discipline. Educ. Record. 43: 197-205.

Shavelson R J 1981 Teaching mathematics: Contributions of cognitive research. Educ. Psych. 16: 23-44.

Shavelson R J 1976 Teachers' Decision Making. In Gage N L (Ed.). The Psych. of Teaching Methods, Yearbook of the National Society for the Study of Education, University of Chicago Press, Chicago.

Shavelson R J 1974 Methods for examining representations of a subject-matter structure in a student's memory. J. of Res. in Sci. Teaching. 11: 231-249.

Shavelson R J 1973 What is the basic teaching skill? J. Teacher Educ. 14: 14-151.

Shavelson R J 1972 Some Aspects of the Correspondence Between Content Structure and Cognitive Structure in Physics Instruction. J. of Educ. Psych. 63: 225-234.

Shavelson R J, Atwood N and Borko H 1977 Experiments on Some Factors Contributing to Teachers' Pedagogical Decisions. Can. J. of Educ. 7: 51-70.

Shavelson R J and Borko H 1979 Research on Teachers' Decisions in Planning Instruction. Educ. Hor. 57: 183-189.

Shavelson R J, Cadwell J and Izu T 1977 Teachers' Sensitivity to the Reliability of Information in Making Pedagogical Decisions. Amer. Educ. Res. J. 14: 83-97.

Shavelson R J and Stern P 1981 Research on teachers' pedagogical thoughts, judgments, decisions and behavior. Rev. Educ. Res. 51: 455-498.

Shavelson R J and Webb N M 1981 Generalizability theory: 1973 to 1980. Brit. J. Math. & Stat. Psych.

Sherman G B and Brown S 1979 Training Reading Specialists in Diagnosis. (Research Paper No. 31), Institute for Research on Teaching, Michigan State University.

Shulman L S and Elstein A S 1975 Studies of problem solving, judgment, and decisionmaking: Implications for educational research. In Kerlinger F N (Ed.). Review of Research in Education. F. E. Peacock, Itasca, Ill.

Slovic P, Fischoff B and Lichtenstein S C 1976 Cognitive processes and societal risk taking. In Carroll J S & Payne J W Payne (Eds.). Cog. & Soc. Beh. Halsted Press, New York.

Smith F L and Lugenbuhl J E R 1976 Inspecting expectancy: Some laboratory results of relevance for teacher training. J. Educ. Psych. 68: 265-272.

Smith E L and Sandelbach N B April 1979 Teacher Intentions for Science Instruction and Their Antecedents in Program Materials. Paper presented at the annual meeting of the Amer. Educ. Res. Assoc., San Francisco, Ca.

Snow R E 1972 A Model Teacher Training System: An Overview. Research & Development Memorandum No. 92, Standford Center for Research and Development in Teaching, Stanford, Ca.

Stake R E 1978 The Case Study Method in Social Inquiry. Educational Researcher. 7: 5-8.

Stern P and Shavelson R June 1981 The Relationship Between Teachers' Grouping Decisions and Instructional Behaviors: An Ethnographic Study of Reading Instruction. Resources in Education, ED 201 971.

Stevenson H W, Parker T, Wilkerson A, Hegion A and Fisch E 1976 Longitudinal Study of Individual Differences in Cognitive Development and Scholastic Achievement. Journal uof Educational Psychology. 68: 377-401.

Taylor P H 1970 How Teachers Plan Their Courses. National Foundation for Educational Research in England and Wales, Slough, England.

Tversky A and Kahneman D 1974 Judgment under uncertainty, heuristics and biases. Sci. 195: 1124-1131.

Varner G F 1923 Improvement in rating the intelligence of pupils. J. Educ. Res. 8: 220-232.

Varner G F 1922 Can teachers select bright and dull pupils? J. Educ. Res. 6: 126-131.

Vinsonhaler J F June 1979 The consistency of reading diagnosis. Research Series No. 28, Institute for Research on Teaching, Michigan State University.

Walker D F and Schaffarzick J Winter 1974 Comparing Curricula. Rev. of Educ. Res. 44(1): 83-111.

Weiner B 1977 An attributional approach for educational psychology. In Shulman L S (Ed.). Rev. Res. Educ. F E Peacock, Itasca, Ill.

Weinshank A April 1980 An observational study of the relationship between diagnosis and remediation in reading. Research Series No. 72, Institute for Research on Teaching, Michigan State University.

Wilson S 1977 The Use of Ethnographic Techniques in Educational Research. Review of Educational Research. 47: 245-265.

Yinger R J 1977 A Study of Teacher Planning; Description and Theory Development Using Ethnographic and Information Processing Methods. Unpublished doctoral dissertation, Michigan State University.

Zahorik J A 1975 Teachers' Planning Models. Educ. Leadership. 33: 134-139.

Zahorik J A 1970 The Effect of Planning on Teaching. Elem. School J. 3: 143-151.

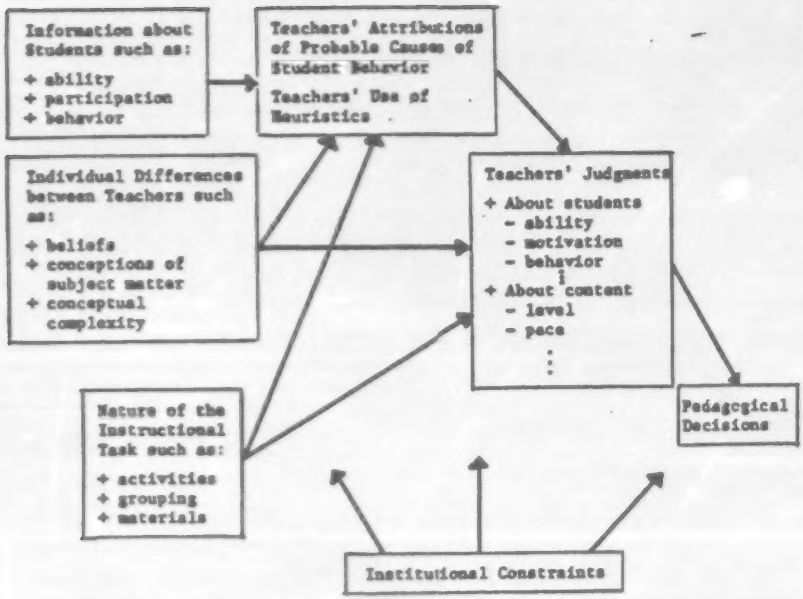

Fig. 1. Some factors contributing to teachers' pedagogical judgments and decisions (from Shavelson & Stern, 1981, p. 472).

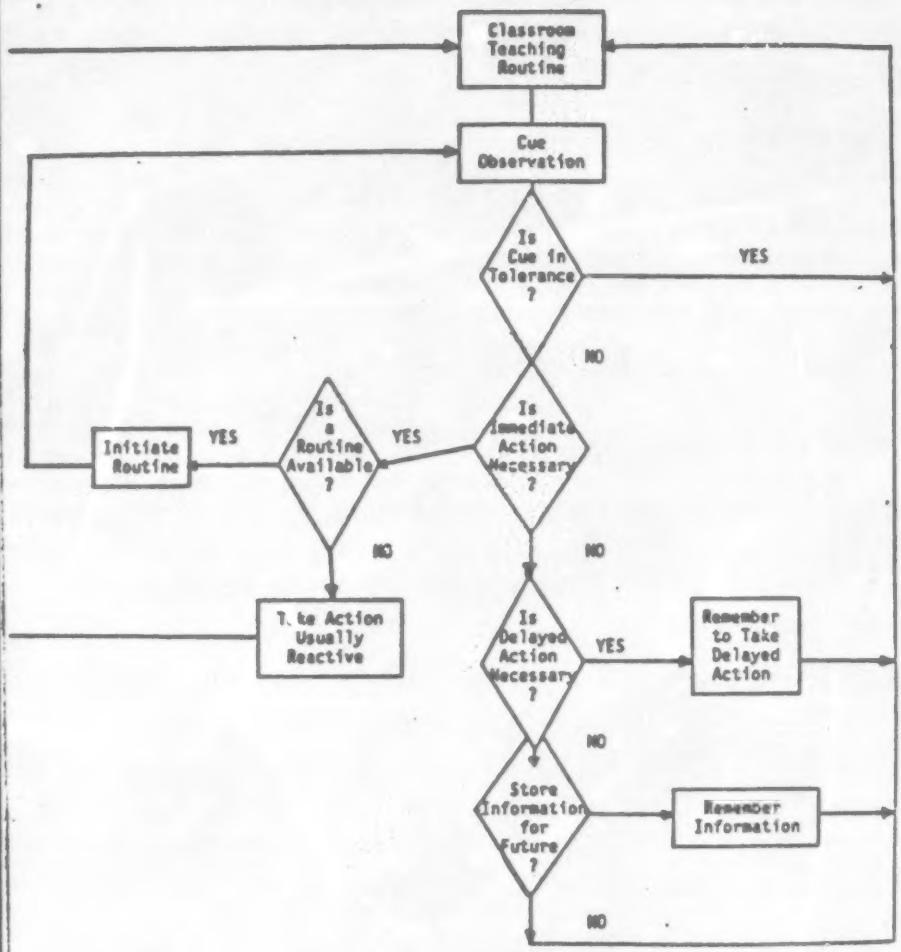

Figure 2. Model of teachers' decision making during interactive teaching (from Shavelson and Stern, 1981, p. 483).

Table 1

Studies of Teacher Planning[a]

Study	Method of Investigation	Content Focus: Subject Matter & Materials	Student Focus	Activities Focus	Specifying Goals or Objectives During Planning Unimportant or Secondary	Teachers Have Long-Term Preactive Plans
Borko (1978)	Laboratory	X	X		Contradictory Findings	X
Carnahan (1979)	Literature Review	X	X			
Clark & Elmore (1979)	Classroom					X
Clark, Wildfong & Yinger (1978)	Laboratory	X	X			
Clark & Yinger (1979)	Laboratory		X	X		X
Cooper et al. (1979)	Literature Review	X	X	X		
Joyce (1978-79)	Theoretical			X		X
Mintz (1979)	Laboratory	X	X	X	X	X
Morine (1976)	Classroom/ Laboratory	X	X	X	X	X
Morine-Dershimer (1978-79b)	Classroom/ Laboratory	X	X	X		

Table 1 (continued)

Study	Method of Investigation	Content Focus: Subject Matter & Materials	Student Focus	Activities Focus	Specifying Goals or Objectives During Planning Unimportant or Secondary	Teachers Have Long-Term Preactive Plans
Peterson et al. (1978)	Laboratory	X	X	X	X	
also see						
Peterson & Clark (1978)	Laboratory					
Russo (1978)	Laboratory	X	X		Contradictory findings	
Shavelson et al. (1977)	Laboratory	X	X			
Smith & Sendelbach (1979)	Classroom				X	X
Stern & Shavelson (1980)	Classroom	X	X	X	Contradictory findings	X
Tayler (1970)	Classroom	X	X		X	
Yinger (1977)	Ethnography	X		X	X	X
Zahorik (1975)	Laboratory	X		X	X	

[a]From Shavelson & Stern (1981, pp. 485-486). A blank space indicates the topic of the column was not a focus of the study.